



LIBRARY OF PRINCETON

NOV 19 2002

THEOLOGICAL SEMINARY



Digitized by the Internet Archive
in 2016

JOURNAL
OF THE
ASIATIC SOCIETY

OF
✓
BENGAL.

EDITED BY
THE SECRETARY.

VOL. XIV.

PART I.—JANUARY TO JUNE, 1845.

Nos. 157 to 162.

NEW SERIES.

“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of Asia will commit their observations to writing, and send them to the Asiatic Society, in Calcutta; it will languish if such communications shall be long intermitted; and will die away if they shall entirely cease.”—SIR WM. JONES.

CALCUTTA:
BISHOP'S COLLEGE PRESS.

1845.

Contents.

PART I.

No. 157.

	<i>Page.</i>
I.—Mr. Ivory's Tables of Mean Astronomical refractions, revised and augmented by Major J. T. Boileau, B.E. Superintendent Magnetic Observatory, Simla.	1
II.—An Eleventh Memoir on the Law of Storms in India; being the Storms in the Bay of Bengal and Southern Indian Ocean, from 26th November to 2d December, 1843. By Henry Piddington; with a Chart.	10
III.—Proceedings of the Asiatic Society for the month of January, 1845.	i

No. 158.

I.—Translation of the Toofut ul Kiram, a History of Sindh. By Lieutenant Postans.—(<i>Continued.</i>)	75
II.—Védánta-Sara, or Essence of the Védánta, an introduction to the Védánta Philosophy, by Sadénanda Parivrájakáchárya, translated from the original Sanscrit. By E. Roer, Librarian to the Asiatic Society of Bengal.	100
III.—Note of the course of study pursued by Students in the Sanskrit College, Calcutta. By W. Seton Karr, Esq., B.C.S.	135
IV.—Memorandum on the Ancient bed of the River Soane and Site of Palibothra. By E. C. Ravenshaw, Esq., B.C.S., with a Coloured Map.	137
V.—Proceedings of the Asiatic Society for the month of February, 1845.	xvii
VI.—Officers and Members of the Asiatic Society for 1845.	xxxii
VII.—List of Members.	xxxiii

No. 159.

I.—Translation of the Toofut ul Kiram, a History of Sindh. By Lieutenant Postans.—(<i>Concluded.</i>)	155
II.—Notices and Descriptions of various New or Little Known species of Birds. By Ed. Blyth, Curator of the Asiatic Society's Museum.	173
III.—Observations on the rate of Evaporation on the Open Sea; with a description of an Instrument used for indicating its amount. By T. W. Laidley, Esq.	213

IV.—On the Alpine Glacier, Iceberg, Diluvial and Wave Translation Theories; with reference to the deposits of Southern India, its furrowed and striated Rocks, and Rock basins. By Captain Newbold, M.N.I., F.R.S., Assistant Commissioner Kurnool, Madras Territory. With a plate. ..	217
V.—Proceedings of the Asiatic Society for the month of March, 1845. ..	xxxii

No. 160.

I.—Description of Caprolagus, a new Genus of Leporine Mammalia. By Ed. Blyth, Curator of the Asiatic Society's Museum. With two plates. ..	247
II.—Report, by Lieut. E. J. T. Dalton, B.N.I., Junior Assistant, Commissioner of Assam, of his visit to the Hills in the neighbourhood of the Soobanshiri River. From the Political Secretariat of the Government of India. With a map.	250
III.—Notes, principally Geological, on the South Mahratta country—Falls of Gokauk—Classification of Rocks. By Captain Newbold, F.R.S. &c., Assistant Commissioner Kurnool.	268
IV.—An Account of the early Ghiljáees. By Major R. Leech, C.B., late Political Agent, Torán Ghiljáees at Kálát-i-Ghiljáee. From the Political Secretariat of the Government of India.	306

No. 161.

I.—Report, &c. from Captain G. B. Tremenheere, Executive Engineer, Tenasserim Division, to the Officer in charge of the office of Superintending Engineer, South Eastern Provinces; with information concerning the price of Tin ore of Mergui, in reference to Extract from a Despatch from the Honorable Court of Directors, dated 25th October 1843, No. 20. Communicated by the Government of India.	329
II.—A Supplementary Account of the Hazarahs. By Major R. Leech, C.B., Late Political Agent, Candahar.	333
III.—Rough Notes on the Zoology of Candahar and the Neighbouring Districts. By Capt. Thos. Hutton, of the Invalids, Mussoorie. With notes by Ed. Blyth, Curator of the Asiatic Society's Museum. (<i>Continued.</i>) ..	340
IV.—On the Course of the River Nerbudda. By Lieut.-Colonel Ouseley, Agent G.G., S. W. Frontier. With a coloured Map of the River from Hoshungabad to Jubbulpoor.	354
V.—A Twelfth Memoir on the Law of Storms in India; being the Storms of the Andaman Sea and Bay of Bengal, 9th to 14th November, 1844. By Henry Piddington.	357
VI.—Some account of the Hill Tribes in the interior of the District of Chittagong, in a letter to the Secretary of the Asiatic Society. By the Rev. M. Barbe, Missionary.	380
VII.—Proceedings of the Asiatic Society for the month of May, 1845. ..	xxxix

No. 162.

	<i>Page.</i>
I.—Notes on the Religion of the Sikhs, being a Notice of their Prayers, Holidays, and Shrines. By Major R. Leech, C.B., Political Agent, N.W.F. From the Political Secretariat of the Government of India.	393
II.—Notes, principally Geological, across the Peninsula of Southern India, from Kistapatam, Lat. 14° 17' at the Embouchure of the Coileyroo River, on the Eastern Coast to Honawer, Lat. 14° 16' on the Western Coast, comprising a visit to the Falls of Gairsuppa. By Captain Newbold, F.R.S., M.N.I. Assistant Commissioner Kurnool, Madras Territory.	398
III.—On the Meris and Abors of Assam. By Lieut. J. T. E. Dalton, Assistant Commissioner, Assam. In a letter to Major Jenkins. Communicated by the Government of India.	426
IV.—Notice of some Unpublished Coins of the Indo-Scythians. By Lieut. Alexander Cunningham, Engineers.	430
V.—On Kunker formations, with Specimens. By Captain J. Abbott, B.A. ..	442
VI.—An account of the Early Abdalees. By Major R. Leech, C.B. Late Political Agent, Candahar.	445
VII.—Proceedings of the Asiatic Society of Bengal for the month of June, 1845.	lv

Index

TO PART I. VOL. XIV.

	<i>Page.</i>		<i>Page.</i>
Astronomical refractions, Mr. Ivory's Tables of mean—revised and augmented. By Major J. T. Boileau, ..	1	Kunker formations, with Specimens By Capt. J. Abbott, ..	442
Ancient bed of the River Soane and Site of Palibothra—Memorandum on the. By E. C. Ravenshaw, Esq. ..	137	Law of Storms in India: An Eleventh Memoir on the. Being the Storms in the Bay of Bengal and Southern Indian Ocean, from 26th November to 2nd December 1843. By Henry Piddington, ..	10
Alpine Glacier, Iceberg, Diluvial and Wave Translation Theories; On the—with reference to the deposits of Southern India, its furrowed and striated Rocks, and Rock basins. By Captain Newbold, ..	217	Law of Storms in India; A Twelfth Memoir on the. Being the Storms of the Andaman Sea and Bay of Bengal, from 9th to 14th November, 1844. By Henry Piddington, ..	357
Account of the early Ghiljáees. By Major R. Leech, ..	306	List of Members, ..	xxxiii
Course of study pursued by Students in the Sanscrit College, Calcutta; Note of the. By W. Seton Karr, ..	135	Meris and Abors of Assam; On the. By Lieut. J. T. E. Dalton, ..	426
Caprolagus, a new Genus of Leporine Mammalia; Description of. By E. Blyth, ..	247	Mergui Tin-ore; Report, &c. from Captain G. B. Tremeneere, ..	329
Candahar and the Neighbouring Districts; Rough Notes on the Zoology of. By Capt. Thos. Hutton, of the Invalids, Mussoorie. With notes by Ed. Blyth, ..	340	New or Little Known species of Birds; Notices and Descriptions of various. By Ed. Blyth, ..	173
Course of the River Nerbudda; On the. By Lieut. Col. Ouseley, ..	354	Officers and Members of the Asiatic Society for 1845, ..	xxxi
Evaporation on the Open Sea; Observations on the rate of—with a description of an Instrument used for indicating its amount. By T. W. Laidlay, Esq., ..	213	Proceedings of the Asiatic Society for 1845, ..	i-xvii-xxxi-xxxix-lv
Early Abdalees; An account of the. By Major R. Leech, ..	445	Peninsula of Southern India, from Kistapatam; Notes, principally Geological, across the. By Capt. Newbold, ..	398
History of Sindh. Translation of the Toofut ul Kiram. By Lieutenant Postans, ..	75-155	Religion of the Sikhs, being a Notice of their Prayers, Holidays, and Shrines; Notes on the. By Major R. Leech, ..	393
Hills in the neighbourhood of the Soobanshiri River; Report of his visit to the. By Lt. E. J. T. Dalton, ..	250	South Mahratta country—Falls of Gokauk—Classification of Rocks. Notes, principally Geological, on the. By Captain Newbold, ..	268
Hazarahs, A supplementary Account of the. By Major R. Leech, ..	333	Unpublished Coins of the Iudo-Scythians; Notice of some. By Lieut. Alex. Cunningham, ..	430
Hill tribe in the interior of the District of Chittagong; Some account of the. By Rev. M. Barbe, ..	380	Védánta Sara, or Essence of the Védánta, an introduction to the Védánta Philosophy by Sadánanda Parivrājakáharya, translated from the original Sanscrit. By E. Roer, ..	100

INDEX TO NAMES OF CONTRIBUTORS

TO PART I, VOL. XIV.

	<i>Page.</i>		<i>Page.</i>
ABBOTT, Capt. J. On Kunker formations, with Specimens,	442	NEWBOLD, Capt. On the Alpine Glacier, Iceberg, Diluvial and Wave Translation Theories; with reference to the deposits of Southern India, its furrowed and striated Rocks, and Rock basins,	217
BOILEAU, Major J. T., Mr. Ivory's Tables of mean Astronomical refractions, revised and augmented,	1	----- Notes, principally Geological, on the South Mahratta country—Falls of Gokauk—Classification of Rocks,	268
BLYTH, Ed. Notices and Descriptions of various New or Little known species of Birds,	173	----- Notes, principally Geological, across the Peninsula of Southern India, from Kistapatam,	398
----- Description of Caprolagus, a new Genus of Leporine Mammalia,	247	OUSELEY, Lieut. Colonel, On the Course of the River Nerbudda, ..	354
BARBE, Rev. M. Some account of the Hill Tribes in the interior of the District of Chittagong,	380	PIDDINGTON, H. Eleventh Memoir on the Law of Storms in India, being the Storms in the Bay of Bengal and Southern Indian Ocean, from 26th November to 2d December, 1843,	10
CUNNINGHAM, Lieut. Alex. Notice of some Unpublished Coins of the Indo-Scythians,	430	----- Twelfth Memoir on the Law of Storms in India; being the Storms of the Andaman Sea and Bay of Bengal, 9th to 14th November, 1844, ..	357
DALTON, Lieut. E. J. T. Report of his visit to the Hills in the neighbourhood of the Soobanshiri River,	250	POSTANS, Lieut. Translations of the Toofut ul Kiram, a History of Sindh,	75-155
----- On the Meris and Abors of Assam, ..	426	ROER, E. Védánta-Sara, or Essence of the Védánta, an introduction to the Védánta Philosophy by Sadánanda, Parivrâjakáchârya, translated from the original Sanscrit, ..	100
HUTTON, Capt. Thos. Rough Notes on the Zoology of Candahar and the Neighbouring Districts. of the Invalids, Mussoorie. With notes by ED. BLYTH,	340	RAVENSHAW, E. C. Esq., Memorandum on the Ancient bed of the River Soane and Site of Palibothra, ..	137
LAIDLEY, T. W. Esq. Observations on the rate of Evaporation on the Open Sea; with a description of an Instrument used for indicating its amount,	213	SETON KARR, W. Esq. B.C.S. Note of the course of study pursued by Students in the Sanscrit College, Calcutta,	135
LEECH, Major. R. An Account of the early Ghiljáees,	306	TREMENHEERE, Capt. G.B. Report, &c.,	329
----- A Supplementary Account of the Hazarahs,	333		
----- Notes on the Religion of the Sikhs, being a Notice of their Prayers, Holidays, and Shrines,	393		
----- An account of the Early Abdalees,	445		

OFFICERS OF THE ASIATIC SOCIETY FOR 1845.

—o—

PRESIDENT.

Right Hon'ble Sir Henry Hardinge, G. C. B. Governor General of India.

Vice-Presidents, . . . {
 The Right Revd. The Lord Bishop of Calcutta.
 The Honorable Sir J. P. Grant.
 The Honorable Sir H. Seton.
 H. W. Torrens, Esq.
 Lieut.-Col. W. N. Forbes, B. E.

Secretary, H. W. Torrens, Esq.

Sub-Secretary, H. Piddington, Esq.

Committee of Papers.

Dr. J. Hæberlin,	|	S. G. T. Heatly, Esq.
Lieut. A. Broome, B. H. A.	|	W. Grant, Esq.
C. Huffnagle, Esq.	|	W. Seton Karr, Esq., C. S.
Baboo Prosonno Comar Tagore,	|	W. B. O'Shaughnessy, Esq., M. D.

Corresponding Members, Committee of Papers.

V. Tregear, Esq.	|	A. Sprenger, Esq., M. D.
Capt. Boileau, B. E.	|	G. G. Spilsbury, Esq., M. D.
Lieut. Phayre, B. N. I.	|	Lieut. Tickell, B. N. I.
Capt. Cunningham, B. N. I.	|	

Curator Zoological Department Museum, E. Blyth, Esq.

Curator Geological and Mineralogical Departments and Museum of Economic Geology, } H. Piddington, Esq.

Librarian, Dr. E. Roer.

Accountant and Assistant to the Secretary, Mr. W. H. Bolst.

Assistant Librarian, Mr. J. Tucker.

Taxidermist, Mr. J. Nicolas.

Treasurers, Bank of Bengal.

Agent in London, Professor H. H. Wilson, India House.

Agent in Paris, Major A. Troyer, 55, Rue de la Pepiniere.

Booksellers and Agents in London, Messrs. W. & J. Allen, Leadenhall street.

LIST OF MEMBERS

Of the Asiatic Society of Bengal, on 1st January, 1845.

- | | |
|------------------------------------|----------------------------|
| Alexander, Esq. Jas. | Cameron, Hon'ble C. H. |
| Anderson, Major W. | Campbell, Esq. A. |
| Avdall, Esq. J. | Cautley, Capt. P. T. |
| | Cheap, Esq. G. C. |
| Baker, Capt. W. E. | Christopher, Esq. A. |
| Barlow, Esq. R. | Colvin, Esq. B. J. |
| Barwell, Esq. A. C. | Connoy Loll Tagore, Baboo. |
| Batten, Esq. J. H. | Corbyn, Esq. F. |
| Bayley, Esq. H. V. | Cust, Esq. R. N. |
| Beaufort, Esq. F. L. | |
| Benson, Lieut.-Col. R. | Davidson, Esq. T. R. |
| ——— Esq. W. H. | Dunlop, Esq. A. C. |
| Birch, Lt.-Col. R. J. H. | Durand, Capt. H. M. |
| Birch, Capt. F. W. | Dwarkanath Tagore, Baboo. |
| Bishop of Calcutta, Rt. Rev. Lord. | |
| Bogle, Major A. | Earle, Esq. W. |
| Borradaile, Esq. Jno. | Egerton, Esq. C. C. |
| Boutros, Esq. F. | |
| Bowring, Esq. L. B. | Forbes, Lieut.-Col. W. N. |
| Boys, Capt. W. E. | Fulton, Esq. J. W. |
| Brandreth, Esq. J. E. L. | Furlong, Esq. Jas. |
| Broome, Lieut. A. | |
| Buckland, Esq. C. T. | Gilmore, Esq. Allan. |
| Bushby, Esq. G. A. | Grant, Esq. J. W. |

- | | |
|--------------------------------|--------------------------------|
| Grant, Hon. Sir J. P. | McKilligin, Esq. J. P. |
| ——— Esq. W. P. | Marshall, Capt. G. T. |
| Gladstone, Esq. M. | Mill, Esq. J. B. |
| Goodwyn, Capt. H. | McLeod, Esq. D. F. |
| Ganthony, Esq. R. | ——— Capt. W. C. |
| Grant, Esq. J. P. | |
| | O'Shaughnessy, Esq. W. B. |
| Hopkinson, Capt. H. | Ouseley, Lieut.-Col. J. R. |
| Hayes, Lieut. Fletcher. | Ommanney, Esq. M. C. |
| Heatly, Esq. S. G. T. | Owen, Esq. Jno. |
| Hæberlin, Dr. J. | |
| Huffnagle, Esq. C. | Prinsep, Esq. C. R. |
| Hannay, Capt. F. S. | Pourçain, Esq. J. St. |
| Houstoun, Esq. R. | Peel, Hon. Sir L. |
| Hill, Esq. G. | Prosonoo Coomar Tagore, Baboo. |
| Hickey, Lieut. C. E. | Phayre, Lieut. A. P. |
| Hodgson, Major-General J. A. | Pratt, Rev. J. H. |
| | |
| Irvine, Lieut.-Col. A. (c. B.) | Quintin, Esq. W. St. Quintin. |
| | |
| Jackson, Esq. W. B. | Robison, Esq. C. K. |
| Jenkins, Major F. | Ramgopaul Ghose, Baboo. |
| Jameson, Esq. W. | Ramnath Tagore, Baboo. |
| | Rustomjee Cowasjee, Esq. |
| Karr, Esq. W. Seton. | Rawlinson, Major H. C. |
| | Ravenshaw, Esq. E. C. |
| Laidley, Esq. J. W. | Ryan, Esq. E. B. |
| Lushington, Esq. G. T. | Radhakant Deb, Behadoor Raja. |
| ——— Esq. E. H. | |
| Loch, Esq. G. | Strong, Esq. F. P. |
| | Strachey, Lieut. H. |
| Maddock, Hon. Sir T. H. | Stacey, Lieut.-Col. L. R. |
| McQueen, Rev. J. | Storm, Esq. W. |
| Muir, Esq. J. | Seton, Hon. Sir H. W. |
| Mouat, Esq. F. J. | Sleeman, Lieut.-Col. W. H. |

- Sutchurn Ghosaul, Behadoor Raja. Willis, Esq. J.
Stirling, Esq. E. H. Withers, Rev. Principal G. U.
Spilsbury, Esq. G. G. Walker, Esq. R.
Shortrede, Capt. R. Ward, Esq. J.
Smith, Lieut. R. Baird. Wilcox, Major R.
Stephen, Capt. J. G.

Young, Lieut. C. B.

Tickell, Lieut. S. R.
Thomason, Hon'ble J. *Associate Members.*
Torrens, Esq. H.
Trevor, Esq. C. B. Blyth, Esq. E.
Torrens, Esq. J. S. Long, Rev. J.
Taylor, Lieut.-Col. T. M. McGowan, Dr. J.
Syud Keramut Allee.

Walker, Esq. H.
-

Oriental Publications for Sale, at REDUCED prices, by the Asiatic Society.


	WORKS.	Rs.	Former Price.
Mahábhárata, vol. 1st, pages 831, vol. 2d, pages 868, vol. 3d, pages 859, vol. 4th, pages 1007, royal 4to.	40	48
Large paper do. do.	50	60
Index to the 4 vols. of the Mahabharat complete.	6	1
Harriwansa, 563 pages, royal 4to.	5	6
Rája Tarangini, 440 pages, 4to.	5	20
Large paper, do. do.	8	12
Naishada, 917 pages, 8vo.	6	6
Sausruta, 1st vol. 378 pages, 2d vol. 562 pages, 8vo.	8	8
Fátawé A'lemgíri, 1st vol. 763 pages, 2d vol. 759 pages, 3d vol. 555 pages, 4th vol. 759 pages, 5th vol. 697 pages, 6th vol. 667 pages, royal 4to., per vol.	8	10
Ináya, 2d vol. 690 pages, 3rd vol. 682 pages, 4th vol. 937 pages, 4to.	8	10
Kházánat ul Ilm, 694 pages, 4to.	8	10
Jawáme ul Ilm ul Riází, 168 pages, with 17 plates, 4to.	4	4
Anis ul Musharrahín, 541 pages, 4to.	5	5
Sharaya-ool-Islam, 631 pages, 4to.	8	15
Tibetan Grammar, 256 pages, 4to.	8	8
Tibetan Dictionary, 373 pages, 4to.	10	12
Asiatic Researches, per vol.	10	12
Burnouf Memoire sur deux inscriptions cunéiformes, 4to. 199 pp.	3	0
Burnouf Commentaire sur le Yacna, with notes &c. 2 parts, pp 945.	10	0

Rs. As.

Burnouf et Lassen, Essai sur le Pali, ou Langue Sacrée de la presquîle au de là du Gange. Paris, 1826, pages 222, 8vo.	... ..	3	0
Elémens de la Grammaire Japonaise, par M. M. Rodriguez et Remusat. Paris, 1825, pages 158, 8vo.	... ..	3	0
Ditto ditto Supplément. Paris, 1826, pages 31, 8vo.	... ..	
Contes Arabes, traduits par J. J. Marcel. Paris, 1835, avec notes, vol. I. pages 484, vol. II. pages 496, vol. III. pages 508, 8vo.	... ..	3	0
Brosset, Elémens de la Langue Georgienne. Paris 1837, pages 122, 8vo.	... ..	5	0
Klaproth, Vocabulaire et Grammaire de la langue Georgienne. Paris, 1827, pages 232, 1st part, 8vo.	... ..	4	0
Cronique Georgienne, traduite par M. Brosset, Text and Translation. Paris, 1830, pages 370, 8vo.	... ..	3	0
Choix de Fables de Vartan, en Arménien et en Français. Paris, 1825, pages 96, 8vo.	... ..	1	6
Elegie sur La Prise D'Edesse, en Arménien. Paris 1828, pages 112, 8vo.	... ..	2	0
Chrestomathie Chinoise—Chinese Characters, 1833, pages 183, 4to.	... ..	5	0
Meng-Tscu, texte Chinoise, pages 161v, 8o.	... ..	3	0

Oriental Publications for Sale, at REDUCED prices, by the Asiatic Society—(Continued.)

	Rs.	As.
Meng-Tseu, traduction Latine, par S. Julien. Lutetiæ Parisiorum, 1824, pages 593, 8vo.	6 0
Lassen, Institutiones Linguæ Pracriticæ. Bonnæ ad Rhenum, 1837, pages 167, 8vo.	6 0
Lassen, Anthologia Sanscritica. Bonnæ, 1838, pages 371, 8vo.	4 0
Lassen, Gita Govinda, Sanscrit et Latine. Bonnæ ad Rhenum, 1836, pages 180, 4to.	2 8
Chezy, Yajnadattabada, ou La Mort D'yadnadatta, Text, Analysis and Translation. Paris, 1826, pages 142, 4to.	3 8
Chezy, La reconnaissance de Sacountala, Text and Translation. Paris, 1830, pages 665, 4to.	10 0
Geographie D'Aboulféda, Texte Arabe. Paris, 1837-40, pages 586, 4to.	8 0
The Travels of Ibn Batuta, translated from the Arabic Manuscript, by S. Lea. London 1829, 143 pages, 4to.	6 0
The Travels of Macarius, translated by F. C. Belfour. London, 1829, pt. 1. 114 pages, 4to.	4 0
Memoir of the Emperor Jehanguire, translated from the Persian Manuscript, by Major D. Price. London, 1829, 141 pages, 4to.	4 0
History of the Afghans, translated from the Persian, by B. Dorn, part I. London, 1829, 184 pages, 4to.	5 0
Han-Koong-Tsew, or the Sorrows of Han, a Chinese Tragedy, translated by J. F. Davis. London, 1829, 28 pages, 4to.	1 8
Vocabulary of Scinde Language, by Capt. Eastwick.	1 0
Leech's Grammar and Vocabulary of the Baloochi and Punjabee Languages.	1 0
Points in the History of the Greek and Indo-Scythian Kings, &c. Translated from the German of Professor Lassen, by J. H. E. Roer, and Edited by H. Torrens, Esq.	5 0

 Separate articles of the Journal are also re-printed, and sold at proportionate rates.

JOURNAL
OF THE
ASIATIC SOCIETY.

Description of CAPROLAGUS, a new Genus of Leporine Mammalia.
By E. BLYTH, Curator of the Asiatic Society's Museum.—With two plates.

In the 'Bengal Sporting Magazine,' for August 1843, p. 131, Mr. Pearson has described an animal by the name *Lepus hispidus*, which I have long been very desirous of examining, and have sought to procure by every opportunity that has offered; and the Society has at length been favored with a fine specimen of it by our esteemed correspondent and contributor, Major Jenkins, Political Agent in Assam, to whose kind exertions in procuring this and other desiderata for the Museum, our thanks cannot be too often repeated.

As I fully expected, this animal has proved to be not satisfactorily admissible into *Lepus*, as the limits of generic divisions are now currently accepted; but must be regarded as a third generic type of the *Leporina*, Waterhouse; or rather, it is a very strongly marked modification of the *Lepus* subtype, and not so distinct a form (equivalent to *Lepus*), as is that of *Lagomys*. In all its more essential characters it is akin to *Lepus*, but exhibiting very considerable modification in the various details of its structure. The head is large, the eyes small, the whiskers slight and inconspicuous; the ears are comparatively very short; tail the same; limbs small, and much less unequal than in *Lepus*; and the claws are particularly strong, straight, and very sharp-pointed, being obviously of important use in the creature's economy: lastly, the fur is very remarkable for an animal of the Leporine group, on account of its harshness, which is well expressed by the specific appellation *hispidus*.

The skull is much more solid and strong than in any *Lepus*, with every modification that should contribute to increased strength, but upon the same subtypical model of conformation; dentition also similar, but the grinders broader and more powerful, and the incisors and rodenial tusks proportionally much larger: the palatal foramina are reduced so that the bony palate is as long as broad; the ant-orbital foramina are nearly closed by obliquely transverse bony spiculæ, corresponding to the open bony network observable in *Lepus*; the nasal bones are broad, with an evenly arched transverse section, and are less elongated backward than in the true Hares,—the maxillaries and intermaxillaries corresponding in their greater width and solidity; zygoma also fully twice as strong as in *Lepus*; the super-orbital processes continued forward uninterruptedly, the anterior emargination seen in the Hares being quite filled up with bone, while the posterior is also much less deep: the *ensemble* of these distinctions is, however, far better expressed by the pencil than by the pen, and the reader is accordingly referred to the accompanying figures of the skull of this animal, in different aspects of view.

What little is known of its essential anatomy is, as might be expected, identical, or nearly so, with that of typical *Lepus*. Mr. Pearson notices that “the mammæ are from six to ten; cœcum very large, apparently almost like a second stomach: womb double.”

The length of the Society's specimen as mounted, and as represented in the annexed figure, is, in a straight line from nose to tail-tip, fifteen inches and a half; ears posteriorly two inches; tail with hair scarcely one and a half; tarsus to end of claws three and three-quarters; entire length of skull the same: fur of two kinds, that next the body short, delicately soft and downy, and of an ashy hue; the longer and outer fur harsh and *hispid*, and consisting partly of hairs annulated with black and yellowish-brown, and partly of longer black hairs, all the black having rather a bright gloss: lower parts paler or dingy whitish: toes somewhat yellowish-white: fur of the tail rufescent above and below, except near its base underneath, and not of the same harsh texture as the body fur.

Mr. Pearson, in his original description of this species, remarks as follows: “From the notes of Mr. C. D. Russell, who sent the stuffed



PLATE 1. Rabbit.

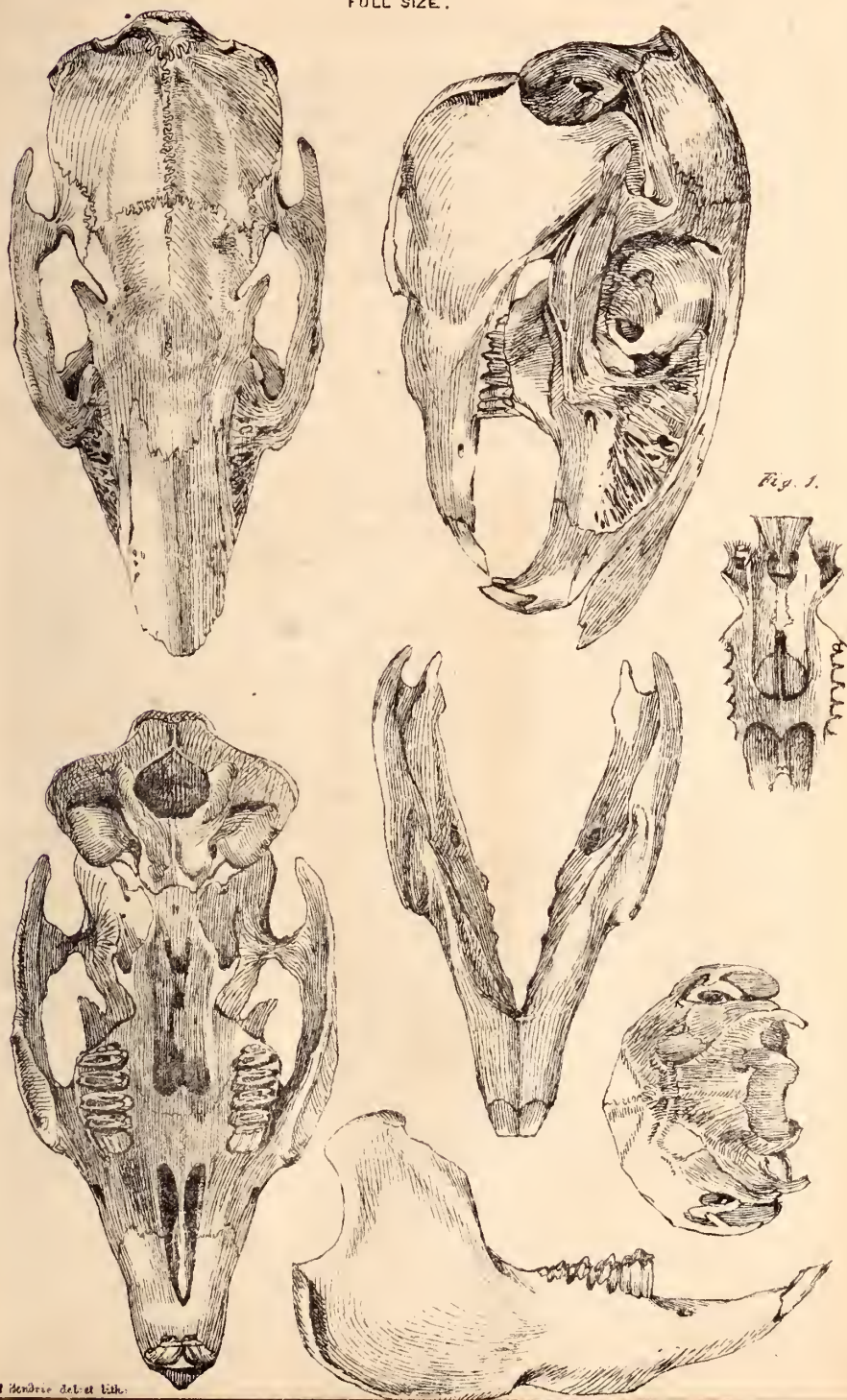
Caprolagus hispidus (PEARSON) BLYTH.



Caprolagus hispidus, BLYTH.

Fig. 1. Palate of *Lepus*.

FULL SIZE.





skin from which the description has been drawn up, I learn that the animal was killed on the right bank of the river Teestah, close under the saul forest, and about six miles north of Jelpee Goree. In this place they are said to be very scarce, not above four having been seen by Mr. Russell's party during ten days, though game of all other kinds was met with in great plenty; and the following year the same party killed only one. But towards the hills, as Mr. Russell was told by the natives of that part of the country, they may be met with in greater abundance. Of the habits of this animal little is known. Mr. Russell states, that 'its flesh is white, and eats very much the same as that of the Rabbit'; and from the circumstance of his never having succeeded in putting one up a second time, he is almost certain that it burrows. It is called by the natives of the country, where it was met with, by the same name that they give to the Hare."

Mr. R. W. G. Frith, upon examining the Society's specimen, believes it to be the same animal as has been very often described to him by sportsmen, who have on several occasions been shooting in the extensive sâl jungle in the district of Mymensing, called the Muddapore jungle, on the western or right bank of the Burrampooter river; but he never chanced to meet with it himself, though he long ago called my attention to the existence of such an animal in that part.

It is included in Messrs. McClelland and Horsfield's list of the Mammalia of Assam, *Proc. Zool. Soc.* 1839, p. 152, but with the statement that the ears are "very short, not projecting beyond the fur," which is either a mistake, or another species is alluded to; though I believe the former to be the truth: Mr. McClelland remarking, "I am indebted to Lieut. Vetch of Assam for the skin of this animal, but unfortunately the skull is wanting. According to Mr. Pearson, however, it is the same as the skull of the common Hare. It inhabits Assam, especially the northern parts of the valley along the Bootan Mountains." The differences of the skull from that of any *Lepus* have been already adverted to.

I propose that it should bear the generic name *Caprolagus*, and be accordingly styled *C. hispidus*, (Pearson,) nobis.

Report by Lieut. E. J. T. DALTON, Junior Assistant Commissioner of Assam, of his visit to the Hills in the neighbourhood of the Soobanshiri River. From the Political Secretariat of the Government of India.

With a map.

Pathalipam Mouzah, *January 6th*, 1845.—Reached this yesterday evening from Luckimpore station, preparatory to setting out on a short excursion up the Soobanshiri as far as I can go in canoes, and thence to the nearest Meri villages by land. My object being to pay Tema Hazaree a friendly visit, and to ascertain if it be practicable to make a more extended tour through the country of the Hill Meris and Abors next cold season.

This day will be consumed in making the necessary arrangements— to-morrow I hope to start.

January 7th.—On the Soobanshiri. With quite a fleet of canoes, I started from the Pathalipam Ghaut at 11 A. M., and considering the difficulty of procuring boats and the number of people to be provided for, there was less trouble, confusion and delay than might have been anticipated.

Including my own boat there are eleven canoes, thirty-two boatmen, and with servants, Tecklas, Katokees and Meri Bhotas, a guard of five sepoys; not less than seventy individuals, all packed as tight as herrings in a barrel. The canoes are moved by gold-washers who, from constant practice in their gold-washing expeditions, are masters of the art of managing boats in the difficult rapids of this river. Indeed I am told that no other men could venture to work up in canoes to Siploo Ghaut, whence we are to proceed by land. The canoes are very small, and, except a light mat over my boat, no choppers allowed.

Amongst these gold-washers are the Pawwas men, whose business it is to convey the Hill Meris and their families who annually visit the plains by this route from Siploo Ghaut to a Ghaut about six miles above Pathalipam. These men, six in number, being most expert of all, act as our steersmen.

They use paddles of “Hingoree,” short and stiff in comparison with the long elastic “Bhola” paddles of the Suddiah and Debroo Thooms. They work the boat however exceedingly well; and no doubt in the pattern and material of their paddles, they have adopted what experience has taught them to be most serviceable for the rapids of this river. In the shallows I see they chiefly work with the luggee poles.

There is a rapid, but a slight one, immediately above Pathalipam ; and from this to the Hills the river is divided by wooded islands into numerous channels : two of these islands are partly occupied by Chuttiah Meris, and they are moreover a fruitful source of quarrelling among the gold-washers. On one of them, called "Indoor" Majali, they brought to our canoes, and commenced making preparations for halting there. I protested against this, as it was not 4 o'clock ; but they asserted very positively, that there was no ground on ahead fit for encamping on that we could possibly reach that night, and as I liked the appearance of the place, a fine shelving beach of sand and gravel, I gave my consent.

They waited till my cook had arranged his temporary kitchen and the dinner was in course of preparation, and then their object of halting on this island was made manifest. A number of gold-washers from the Bor Dolonee Mouzah, on the left bank of the river, were washing a little above the halting place. The Pathalipam gold-washers considered the ground theirs, and wished me to serve the intruders with a summary ejection. The left bank people as stoutly asserted that they were on their own ground, and it was by no means an easy dispute to decide. It depended on which of the channels is the main channel of the river, but the river takes to them all in turn about.

January 8th. Started after all had breakfasted at 8 A. M. The back ranges of the mountains are disappearing one after the other behind the upstart lower hills. The rapids numerous, but not difficult.

The Sonaris have boat songs, or professional melodies of their own : when wading and hauling the canoes up the rapids they sing a sort of "cheerly boys," the chorus of which is "Yoho Ram," and which heard above the roar of the waters has a good effect. In hollowing out these canoes the carpenters make in them holes of about an inch square to ascertain the thickness as they proceed. These holes are afterwards plugged. In my boat being driven in from above they protruded below, and two of them were at the same moment unshipped as we bumped on the stone of a rapid. The boat commenced rapidly filling, but we got her on shore and the baggage all removed, before any serious damage was done. I mention this as a warning to others. One minute's delay and the boat would have sunk ; we were fortunately near shore, had surmounted the rapid, and the crews of the other boats all at hand in a moment to assist.

Digression up the bed of a small stream called the Doolooni, to see the Raj Ghur. This Doolooni was one of the gold streams; but last year its bed of shingle was covered with fine sand which the gold-washers can make nothing of, and they have abandoned it. It forms also one of the passes by which the Turbotiah Meris descend, the Dirjoo flowing through Sugal-doobey, which forms the other starting from near the same point in the hills. The Raj Ghur we found about a mile from its mouth. I have seen this Ghur at Goomeri, where it crosses the Booree river, and there it still bears the appearance of having been constructed as a rampart against the inroads of the hill people; but here it has more the appearance of an old road. It is however a stupendous work, and great is the pity that it is too far north of our population to be used as a line of communication. Previous to the Moran or Muttock wars, the villages of Luckimpore are said to have extended up to this Raj Ghur, and there is every appearance even now of such having been at some period the case. At the mouth of the Doolooni the Soobanshiri expands with a fine broad, deep and smooth basin, which it enters by three channels formed by two islands, where the stream again meets; above them it emerges from the hills, and here we halt for the night; our encamping ground is in the dry bed of the Bergoga.

January 9th. Our last night's bivouac was not a comfortable one. A stiff breeze blowing down the bed of the Bergoga, was met by another coming down the valley of the Soobanshiri, and they enjoyed themselves together at our expence, blowing the sand into the people's dinners, and the smoke into our eyes, and knocking the canoes against the stones. But we are now fairly amongst the hills, and truly the scenery is sublime. Beneath these hills, the great river winds in graceful serpentines. The basis forming the cliffs are rocky and precipitous to a considerable height, along which foliage of various hues and a most vernal and velvety appearance waves in the breeze. The stream is about 250 yards in breadth, but of a depth (sounded several places on returning and found between sixty and seventy feet in depth throughout this glen) unfathomable by any means we have at hand. There the rock of storms (the Botahkowa hill) stands boldly out from the mass on a bed of huge boulders screening the mouth of a deep, dark, narrow dell, the winding of which I explored for a little way—a way, where the sun's rays never penetrate; sometimes huge Bon-trees springing from the rocks above stretch their

sinewy limbs over the deep waters, which reflect them ; and the fibres that descend from them, finding no earth below in which to fix themselves, swing in the breeze.

As we advance the river becomes still narrower, but not less deep or smooth. Gockain Potana, a rock not less than 800 feet in height, rises perpendicularly from the stream. The face is almost smooth to the top which is clad with trees ; on the opposite side a similar cliff, but not so high : on the summit of the former a god killed a deer ; and, walking (clever fellow) down the face of the smooth rock with his quarry over the shoulder, he ascended with it the opposing cliff, *unde nomen*. From above, the rock called the Gockain Potana looks like a huge church-steeple rising from the stream. We stopped for sometime at a place called Pabo Ghaut to collect cane to be used in towing the canoes up the rapids on ahead. The Ghaut is so called from its having been some 50 years ago the watering place of a tribe of Meris called Pabon. One of the young men of this tribe stole from her village a young virgin of Tema's tribe, then under the management of his father Temees. For this offence the insulted Temeeans waged a war of extermination against the Pabo tribe. The villages of the latter were attacked by night when the inhabitants slept, and men, women and children were promiscuously slaughtered or carried away, and sold into hopeless captivity amongst the Abors. The tribe, consisting of two large villages, were utterly extinguished. Not far from this we halted for the night, on the right base of the river, at the mouth of a beautiful stream called the Gaien Panee, issuing from a dark glen and dashing down the rocks into the well-bound channel through which the Soobanshiri noiselessly flows. Notwithstanding the absence of large timber which appears to grow only near and on the summits of these precipitous hills, the verdure of this valley is very beautiful : the rocks themselves are frequently covered with moss and ferns of the brightest emerald green ; whilst springing from the soil above them bamboos of a peculiarly light and feathery appearance, the shafts not thicker than the most delicate trout rod, curve and waive in the slightest breeze. The pine-apple tree, the drooping leaves of which are found upwards of sixteen cubits in length ; the Toka palm, varieties of cane and the mountain plantain, are all characteristic of this scenery, and blend together in luxuriant mass.

10th. Early this morning we emerged from this great glen, and found the first of the great rapids at its mouth. The canoes were safely pulled up with the long cane ropes we had provided; above this rapid the stream widens, the valley expands, and more distant mountains appear in sight. Huge blocks of rock obstructing the river in its descent render the navigation more and more difficult. We were obliged to lighten our boats, and for some distance the baggage was all conveyed by land, whilst the canoes were dragged through fields of hissing foam, or over rocks nearly dry; after surmounting several such rapids we reached Siploo Mookh whence we are to proceed by land.

Luckimpore, February 11th, 1845.

February 21st.

MY DEAR MAJOR,—This being a holiday, I shall devote it to giving you some further account of my late excursion.

I wrote you a few lines from Siploo Mookh, detailing briefly my proceedings up to the date of my letter. On the 15th January all the headmen of Tema's tribe made their appearance, together with the ladies of Tema's family, who came expressly to welcome me—his two wives and daughter. I held an assembly, and particularly explained to the chiefs that if they had the smallest objection to my proceeding further I was ready to return; but they all assured me that such a proceeding would cause them great pain. They would be delighted to shew me all the lions of their country; but only begged, that as the small-pox was raging in the Pathalipam village, I would leave behind me all the Pathalipam men. This I readily consented to do, provided they procured me a sufficiency of Meri coolies. Affairs having been so far amicably arranged, a distribution of salt and rum concluded the conference; and the Gaums in high good humour disported themselves before me, shewing their agility in racing over the rocks, and their prowess in throwing stones across the river: mean time I gave the ladies who had come to greet me some gay colored cotton cloths; and here, alas, was cause for jealousy. The other Gaums would know why Tema's family alone should be thus favored; but I told them that when their wives and daughters came to greet me (as Tema's had done) and were neglected, they might take umbrage at my

partiality, but not now ; and with this they appeared satisfied. Late at night Tema and one of the Torbottiah Gaums again visited me. They said a sufficient number of coolies would by morning be collected, but they expected to be paid for the trip ; considering the friendly nature of my visit, and the honor thus done them, they (the Gaums) were ashamed to ask me to pay the people for conveying the baggage, but they had no power to give men without such payment being made ; and they therefore wished, if agreeable to me, to be allowed to *defray the cooly expences between them*. Of course I declined this offer, though I was not a little pleased at its having been made, evincing as it did a genuine good feeling towards me. The rate was to be one seer of salt, or four annas, for the trip for each cooly, which the Gaums assured me was what they paid when, in bringing, as they yearly do, various commodities from the plains, they are necessitated to avail themselves of extra hands. Those who call themselves Gaums have no authority in their hills, but that of the rich over the poor. After the above noticed trait of liberality on Tema's part, and of the independence of the Hill Meris in general, I was not a little amused next morning when the Meri coolies, male and female, were receiving beforehand their seer of salt, to observe amongst the applicants for a load and a douceur, Tema's second wife and his eldest daughter, both fine young women ; but the latter much disfigured by small-pox. The loads were light, not more than twenty seers ; but boys and girls, men and women, were all paid the same rate. Considering all these arrangements had to be made, and that the greater part of the coolies had only arrived in the morning, I thought myself lucky by getting off by 10½ A. M. For the first two miles we proceeded along the left bank of the Siploo flowing from N. W., then turning north ascended a very steep hill ; sometimes almost creeping under jungle so dense, that nothing could be seen beyond what was a few yards to our right and left : the path was less difficult than I had been led to suppose it, but is sometimes zigzagged up or wound round precipices in an awkward manner for nervous people. Tema was my constant companion, always prepared to give me a friendly hand if necessary. He seemed at first to be under great anxiety on my account ; but finding me more active than he expected, he appeared more at ease.

Of the various timber trees and underwood, you know I am incapable of giving any account ; the most remarkable of the former were Sea trees, a

seed of which you returned me split open, the wood is hard, close-grained, and finely colored as the Nahore; the Assamese call it the *Seea Nahore*, and the fruit contains a poison with which the Meris kill fish. Great varieties of bamboos and cane. The Meris thatch their houses with the leaves of a species of the latter called *Tor*, the pine-apple tree, and the fern.

We passed several squirrel traps of an ingenious and simple construction. On an overhanging branch a seed (chestnut) of which the squirrels are fond is placed, and bound to the branch by a double band of cane; the squirrel cannot get at the seed without putting his head through a noose of the cane, and on his disengaging the bait the stone drops and tightens the noose round the squirrel's neck: they eat the flesh of this animal as a great delicacy. As we ascended this hill, the hill people frequently gave us lowlanders a warning to be careful not to loosen a stone from its bed. This was very necessary, people are apt to kick away stones on a hill that are easily dislodged; and had this been done on the present occasion, they must have fallen on or bounded near those coming up the winding path below us. Having descended a valley in which there was water, we commenced the ascent of another and loftier mountain called *Teepooka*. On this hill there are magnificent *Nalok* trees of enormous dimensions; descending again we came to a rocky stream called the *Tiks*, up the bed of which our path now lay, and this was to me the most difficult part of the road. The current was strong, and the rocks slippery as glass. It was difficult for me to maintain my footing, and as I proceeded along slowly and cautiously, the Meri girls with their loads came up and laughingly passed me, bounding with astonishing activity and sure-footedness from rock to rock. This stream takes its rise in the *Moyur* mountain, over which our path now lay; and learning that we should not see water again till evening I halted for stragglers, and when all had come up it was too late to think of attempting to proceed further. Crossing the stream accordingly, we formed our bivouac for the night. *Tema* endeavoured to persuade his people to assist in clearing a space for me, and to cut and bring wood and materials for a temporary hut; they treated his orders with the utmost contempt: upon my applying to them in a more persuasive strain, they bargained that I should shew them some fun with my guns, and in this way I got them to do all I wanted. We started next

morning at 8 A. M., and commenced a toilsome ascent of the Moyur mountain, the summit of which we did not reach till 11 o'clock; the ascent was very severe in many places, the natural ladders afforded by the roots of the trees alone rendered it practicable; near the summit it was less precipitous, and here were the timber trees and Seas, wild mangoes, chesnuts and oaks, the seeds of all which I have sent you; but unfortunately the acorns were all dead. From the top of the Moyur no view was obtained; descending occasional openings gave us glimpses of new mountains, for we were now on the north side of the great range seen from Luckimpore, but no extended view; the path less difficult, but occasionally presenting but a mere ledge over a precipice, and dangerously slippery from decayed leaves. We descended about one-third of the distance we had ascended, and then crossed over several smaller hills, the northern outworks of the Moyur. In one place a large tree had fallen across a chasm deep and dark, and was used as a bridge. It was slippery as glass, and even the Meris passed over very slowly and cautiously; I did not like it much, but Tema gave me a hand, and I got safe across. We now came to hills that had been cleared for cultivation, and other symptoms of a near approach to human habitations; not that the road was better, it continued just as before, but here Myttons had been grazing, and they do not stray far from their villages. Several times we passed what appeared to be a well cleared path, but I was told that they led to where spring bows had been set to kill wild animals, and the clearance was made to warn human beings *not* to go that way. Depending much upon such stratagems for a supply of animal food, they have various ingenious methods of taking or killing wild beasts. A deer trap is constructed by running a light palisading between two precipices or other obstacles, in the centre of which the trap is placed. It appears to offer an exit to the unwary animal, whose course has been obstructed by the palisading, and through it he attempts to rush, when the top composed of logs of wood bound together drops on and crushes him. Bina Meris village was now before us, and drawn up on the side of the road a deputation of the Sonrok Meris (the Bor Dolonee Meris) awaited my approach. These Sonroks I had hitherto regarded as not near so well affected to us as the Temas and the Torbottiah tribes, and I had been informed by Tema that they were very irate with him for having encouraged this excursion of mine. I was by no means

anxious to meet them, and had not invited them to an interview : but here they were, and I could not decline it; so putting a bold face on the matter, I took a seat under a tree and gave them an audience. After having explained my object in visiting these hills, and thanked them for their civility in coming to meet me; very much to my surprise, instead of any objections being raised, they gave me a most cordial and pressing invitation to proceed to *their* villages too, saying as I had come as a friend to visit Tema, it was not fair that the honor should be conferred on him alone; they too were most anxious to entertain me, and would gladly provide every thing necessary. One of their villages, that in which the principal Gaum resides, was an easy march from where we stood. They did all they could to induce me to go, overruling all my objections as started. I had only supplies for three days,—they would provide every thing. At last I said it would be improper for me to go to their village without bringing with me some presents to bestow on their wives and daughters to cause them to remember my visit. That of the few things I had brought of this description, had been disposed of, or were bespoke, and were I now to go empty-handed to visit them, they would all say that I had bestowed many marks of favor on Tema's people and to them had given nothing. I therefore could not now go; but if all turned out well, and they behaved themselves properly on their next visit to the plains, they should receive a visit from me at another season intended for them, as my present visit was for Tema. With this they appeared satisfied, and only further begged that I would excuse the old Gaum coming to meet me in another Gaum's village, which would be derogatory to his dignity, and allow him instead to pay his respects at Siploo Mookh, or on the road down. This was so ruled, and thus quietly ended the conference with the ferocious Sonroks. Bini Gaum's village which we now entered, is situated on one of the low hills under the Moyur mountain; the houses are long, and raised considerably on posts of cleft timber, indiscriminately constructed on the top or side of the hill, but the level of the flooring is tolerably well preserved by varying the height of the supporting posts. It contains only ten dwelling houses; but as each house holds an entire family, including brothers and their wives, and married sons and their children, each may on an average contain about twenty individuals. The situation of the village is very beautiful. The

low hills around,—some partly cleared for the purposes of cultivation, some entirely so, and now covered with the straw of the crop last reaped,—appear in fine contrast with the dark tints of the lofty mountains of Moyur and Yaloo, and others more distant that surround it. The inhabitants, men, women and children, far from evincing any signs of fear, crowded about me as I passed through the village. The road from this to Tema's village, which is about two miles distant and north-west of this village, continues over low hills, many of which have been cleared and are now fallow, and after a time will be again taken up. Between the villages barricades are constructed in different places to keep the Myttons from the cultivation when necessary. We followed the windings of a stream called the Kutoo, and were led by it into a pretty little valley comprising a level space of cleared ground of some extent, watered by the Versing river which winds round the hill on which Tema's village is built, and here we encamped; Tema's village within hail above us to the S. E., the river flowing from the N. W. Here were assembled to meet me, besides the notables of the three villages of Tema's, or the Pambottiah tribe, all the headmen of the *Torbottiah dewar*. They* seemed to wonder much at my visit. What could it portend? and to be in some alarm; but this soon wore off. They describe their country as much better worth seeing than this. The villages are larger, more numerous, and nearer to each other than those of this dewar; the nearest a day's march from this, about twelve miles in a direction north by west. The villages are six in number, and within hail of each other, on hills as Tema's and Bina's, and the houses similarly fashioned; their cultivation is more extensive, the crops fewer, and more varied. They have asso, dhan, and hali; but the latter is not planted out. They sow the seed as we sow peas. They kept me talking till dinner time, and then all retired with Tema, who had a grand feast, not less than eighty individuals were entertained by him; all that came to see me were invited, and I am told his house was crammed: nor were we neglected, a fine fat kid and fowls and eggs, yams and sweet potatoes and Indian corn were supplied. Tema asked me if I would drink *mhud*, the spirit they distil; but this I declined, or doubtless a large supply would have been sent.

* The Torbottiahs.

Next morning I proceeded to the village, and found them all busily engaged in divination as to whether my visit was to bring them good or evil. I was told that the auspices were favorable. A man sat apart from the rest holding in both hands a puny chicken, and invoking all the spirits of the woods by name. Those deities who delighted in the blood of Myttons, and those who rejoiced in the slaughter of pigs; those who were propitiated by the sacrifice of fowls, or those who were content with a vegetable offering, all are on such occasions invoked; and after the *Chout* is terminated, the chicken is cut open and the entrails examined, from which they augur good or evil. Often as this "auspicious" to my knowledge has failed them, they most pertinaciously adhere to the practice; and undertake no expedition, journey or work, without consulting it. I was sketching, and when the "auspicious" were being taken, and when the ceremony was concluded, they sent to me to beg of me to return to my hut to give audience. I desired for peace' sake to give it where I sat; but the Torbottiahs who wished to pay their respects in regular form, could not, they said, with propriety do so in Tema's village. However, previous to descending I paid Tema's house a visit, to which he made no objections. The house is seventy feet long, raised on timbers, some perpendicularly and some diagonally placed, in which is laid a platform of bamboos for a flooring. The roof has gable-ends, and is pitched very high; the thatch being composed of the leaves of a species of cane as before mentioned. Under the gables a cross chopper covers in an open balcony, one at each end. The interior consists of one long apartment sixty feet by sixteen, from which a passage extending the entire length is partitioned off. In the large apartment down the centre no less than four fires were burning on hearths of earth. On one side were ranged, with some appearance of order, their arms, pouches, travelling apparatus, &c.; another portion of the apartment was decorated with trophies of the chase. In the centre between the fires frames of bamboos suspended from the roof served as tables, on which various domestic utensils were deposited. I had hoped that the passage which was partitioned off from this apartment contained the dormitories of the family, but on examination it was found to be the *mhud* cellar. In it were ranged conical baskets lined with plantain leaves, in which the *mhud* is fermented, and received in vessels placed underneath: in the large apartment the whole family eat, drink and sleep.

Tema and his wives in the upper end or first fire, his sons and daughters round the next, other members of the family round the third, and slaves and dependents round the fourth. Fearful of being pillaged by the Abors, they do not venture to display much property in their houses. The greater portion of it lies buried in some remote spot known only to the heads of the family. Besides cattle, ornaments, arms and wearing apparel, it consists of large dishes and cooking vessels of metal, and what are called *Dao Guat*, such as little bells with various devices and inscriptions, in what I fancy must be the Thibetan character; but I know it not. The Meris do not know where they come from; a few are occasionally obtained in barter with the Abors, but the most of them have been handed down as heir-looms in the family, and they are regarded as the most valuable portion of their property. They are occasionally used as money, and valued at from four annas to twelve rupees each, according to shape, size and ornament. Those with inscriptions inside and out are most highly prized. Those without inscriptions are little valued. These bells are common amongst the Dufflas, who can give no better account as to how they became possessed of them. I am told the Butias sell them, and if so you can perhaps tell me something of their origin. The Meris tell the same story if asked where they get their fine blue beads, *i. e.* that they are heir-looms; very seldom, they say, are they now procurable in barter or exchange, though some few are occasionally procured from the Abors.

It is not impossible that numbers of these bells and beads thus handed down as heir-looms may have been brought with them from the country from which they originally emigrated. Regarding their migrations they have no traditions. They believe, and they are not singular in the belief, that many orders and races of men were created, whom the Creator allotted to dwell where soil and situation were best adapted to the constitution and habits he had given to each; and thus that the Meris were created for, and have ever dwelt in these hills. Their religious ideas are very vague. They believe in a future state, and have an indefinite idea of a spirit who presides in the regions of departed souls, as is shewn in their mode of disposing of their dead. The body is interred fully clothed and equipped with arms, travelling pouch and cap, in a deep grave, and surrounded by strong timbers to prevent the earth from pressing on it. Nor do they omit to supply

the departed for his long journey with food, cooking utensils, and ornaments of value, so that he may make a respectable appearance in the other world. They attach great importance to their dead being thus disposed of and buried near the graves of their ancestors. If a man of any influence dies in the plains his body is immediately conveyed to the hills to be so interred, should the disease of which he died not be deemed contagious.

Marriage, although its violation is considered the direst of offences, is with them a mere matter of barter or exchange. Young ladies are in the first instance valued according to the wealth and respectability of their parents. The price is such that few suitors are able to make it up for several years after preliminaries have been arranged, and they pay it accordingly by instalments. It consists, if the damsel be of high family, of two or three Myttons, twenty or thirty pigs, fowls, mhud, and sometimes clothes. When the parents are content, or the stipulated amount has been paid, they invite the suitor with his family and friends to come for his bride, and he is entertained that day by the father of the lady. On his return with his wife all the friends and relations accompany him, and the bridegroom or his parents now in their turn have to feast them and his own friends into the bargain for several successive days. There is no further ceremony. The parties are now considered man and wife; and woe be to him that seduces from her lord the wife so wedded. The adulterer is seized and securely bound, detained under most rigorous treatment for a day or two. If he be powerful his friends come to his assistance, and make offers for his ransom, which must be considerable to be accepted; but the chances are, he is left to his fate, and if such be the case he is put to death. The woman who has committed the *faux pas* is less severely dealt with. A little wholesome chastisement, and she is again admitted into the family circle. It must not be omitted that when a marriage is concluded, the bridegroom expects to get fair value with his bride for his pigs, &c. that he has expended on her. If personally, or in default of an adequate *trousseau* she be found wanting in this respect, there is a dinner, an assemblage of the mutual friends, and the parents of the bride are made to disgorge should it be so determined; or should they refuse, their daughter is treated as a slave, and not as a member of the family: notwithstanding this, a widow cannot leave her husband's family and heirs to contract a fresh

marriage unless she can find the means of defraying all that was originally paid for her ; if she can do this and furnish a feast on the occasion, there seems no objection to her making a second alliance. The costume of the women is peculiar : a short petticoat extending from the loins to the knees is secured to a broad belt of leather which is ornamented with brass bosses, besides this they wear round their middles an infinite number of rings made of filaments of bamboo embroidered with the fibres of another plant. A band of similar material, from which a bit of cloth is suspended in front, is bound tightly round the breast under the arms. This is their travelling and working dress ; but at other times they wrap themselves in a large cloth doubled, brought over the shoulders, and pinned in front like a shawl. They wear round their necks an enormous quantity of beads, mostly of blue, like turquoise, but also of agate, cornelians and onyx, and glass beads of all colors. They have bracelets of silver or copper, and anklets of finely plaited cane or bamboo. Their hair is adjusted with neatness, parted in the centre and hanging down their backs in two carefully plaited tails. In their ears they wear most fantastic ornaments of silver, which it would be difficult to describe ; a simple spiral screw of this metal winding snakelike round the extended lobe of the ear is not uncommon amongst unmarried girls ; but the ear ornaments of the matrons are much more complex. They generally have very sweet countenances, though few could be called handsome. The almond-shaped eye is common, but not universal ; mouths generally well formed ; and teeth, notwithstanding the free use of tobacco, very fine and white ; their complexion what the natives of India would call fair, but they have rosy cheeks and ruddy lips, which is a decided improvement on the Assamese complexion ; they are very stoutly built, generally short of stature, but to this there are remarkable exceptions. The men have fine muscular figures ; many of them tall and with good features, but the countenances of some are repulsive. The variety of feature denotes an admixture of races, and no doubt many of them have Assamese blood in their veins, but usually there is the high cheek-bone and almond-shaped eye, lips rather thin, and face devoid of hair except a few over each extremity of the mouth forming an apology for a moustache. They gather the hair to the front, where it protrudes out from the forehead in a large knob secured by a bodkin ;

round the head a band of small brass or copper knobs linked together as tightly bound. In their ears they as well as the women wear a variety of ornaments, but of a distinct kind. The lobe is distended so as to hold a knob an inch in diameter. It is gradually enlarged by the insertion of a roll of the leaf of the pine-apple tree. The chiefs wear ornaments of silver, shaped like a wine-glass or egg cup; young men do not venture to attach so heavy a weight to the slight ligament, and insert a hollow plug of silver instead. The males also wear a profusion of the blue beads before mentioned, and others, all very large. Their costume is simple enough—a band round their hips composed of rings of bamboos, the same as worn by the women but not so numerous; an apron attached thereto before and behind, and a cloth wrapped round their body and pinned so as to resemble a shirt without sleeves; a cap of cane or bamboo work with turned-up peak, which however is worn behind, and over their shoulders as a cloak, which also serves as a pouch or knapsack, they throw a covering made of the black hairy fibres of a plant, which at a little distance resembles a bear-skin. Their costume is not complete without placing on their heads and over their caps a piece cut out of tiger or leopard-skin, the tail of which hanging down their backs has a droll appearance! They are all very filthy in their persons, many of them appear never to have had their faces washed since their birth. As this was not their cultivating season, and the crops had been reaped, it was chiefly from information that I could note any thing on the subject. Each village has a certain extent of ground, comprising hills, sides of hills and valleys, which they have been in the habit of cultivating from time immemorial; but not more than a fifth of this ground is under cultivation each season. They cultivate each patch two successive years, and then suffer it to be fallow for four or five, taking up again the ground that has been longest fallow in lieu. They have a superstition, which deters them from breaking up fresh grounds so long as their "Gra" (fallow) is sufficient—a dread of offending the spirits of the woods and forest by unnecessarily cutting down the trees. In Tema's village the chief crops are "Bobesa" or bobsa dhan, the grain of which is large, pear-shaped; and goom dhan, or maize. Many of the villages have aoosa and hali, resembling that which is grown by the Assamese; but the cultivated

tracts appertaining to this village get too little sun for those crops. The bobsa and goom dhan are sown in the same ground and at the same time, and round the squares which contain these crops they plant yams and other edible roots ; they have not got the potato, but it would most likely grow well and be serviceable to them ; they sow red pepper, which succeeds admirably. Tobacco is generally grown in patches near the houses. The labour of cultivation and all labour falls chiefly on the women. They have few of them other implements than their *daws*, which are used to clear, cut and dig with. The men consider it sufficient to occupy themselves in hunting and attending to their various snares and spring bows for wild animals, and when the season arrives for the trade, in collecting manjeet, which is performed by both sexes.

The manjeet grows in steep declivities, interlaced and entangled with other shrubs, so that it is not easy speedily to collect a quantity, at least all that I found of it was little ; the leaf of the genuine kind is small, narrow and pointed, and slightly suffused with a tinge of the colouring matter. There is a bastard kind also found in great quantities, the leaves of which are very much larger and the plant altogether coarser in appearance ; it is called the female manjeet by the Meris, and though similar in growth with the other, its flexible shoots contain scarcely any colouring matter. Nevertheless, it is sometimes brought down mixed with the finer. The Meris assured me that this fraud was not theirs, but was practised upon them by the Abors. I recommended them for their own sake to bring down none but the best, and they promised that none other should leave their country. They collect and tie it up in bundles when fresh and flexible, then lay it on frames or hang it up to the eaves of their houses to dry ; when it becomes rather brittle, it is fit for exportation. The Mytton is the only species of horned cattle possessed by the Meris. It is rather a clumsy looking animal in make ; but a group of Myttons grazing on the steep rocky declivities they seem to love, would be a noble study for Landseer ; some are milk-white, some nearly black, some black and white, and some red and white. To the Meris they are only useful as food. On festive occasions one is killed, and I should think the beef must be excellent ; they feed most delicately on young leaves, and keep in excellent condition. The

cows would, I have no doubt, give a large supply of milk; but the Meris have not yet found this out. I asked them to procure some for me, but received the usual answer, "Meris don't know how, not our custom." The females appear tame, and submit to be tethered; the bulls rove their own masters, but do not wander far from the tethered females, so are in a measure tethered too; just now they all roam where they please, but when the crops are on the ground a mountain or so is fenced round by strong timbers from tree to tree, and into this enclosure they are driven, and remain till the harvest is stored. They have pigs and poultry in plenty, and a few goats. I suppose there are no people on the face of the earth, more utterly ignorant of every thing connected with the arts than are the Hill Meris. With the sole exception of the bands and other articles of bamboo cane and fibres above-mentioned, which the women are everlastingly making, every thing they use is imported; were their communications directly with the plains, and indirectly by means of the intervening tribes, with the civilized countries on the other side of the great range cut off, the use of metal and of women's clothes would be lost to them. The Abors can forge themselves daws, but the Meris know not the art. The most distant tribes manufacture coarse cotton cloths; but though the Meris are in constant communication with them, as well as with us, they have not the remotest idea of weaving. They cannot journey two or three days from their village, without having to cross a considerable river. If it be not fordable, a rough raft of Kakoo bamboos is hastily constructed for the occasion; but though constantly requiring them, and annually using them, they have never yet attempted to construct a canoe: this is the more strange, as the Abors of the Dabong push a considerable trade in canoes cut in the rough. I suppose that until the Meris discovered the fertile plains of Assam, which they were first led to visit by having killed birds in whose bellies they found rice, and discovered by proceeding in the direction of their flight, they were mere savage hunters; the skins of beasts their only clothing, and the flesh their chief, if not only food.

Could they be stimulated to a more industrious course of life, they might considerably improve their commercial relations with us. The great rivers that enter their country abound in gold grains; the process

Map to accompany
Lieut. Dutton's Report
on the Meris and Abers
of Assam



4 miles to an Inch

of washing is simple, and the Meris have had for two centuries constant opportunity of watching it in all its phases.

The last process of separating the gold from the remainder of the sand or scoria, they might leave to the Assamese gold-washers; but the rough washing with the *doorunnee* and bottle gourd might be performed by them, and a considerable quantity of gold introduced. The *doorunnee*, or tray, is very simple and easily made, and the gourds are obtained from the Meris by the gold-washers. This would be a most lucrative trade for them. By a little attention to the manjeet also, which they are too lazy to give, its growth might I think be improved and its collections facilitated, simply by the removal of other plants that choke it. I have not much more to say; but I may send you another chapter* if you are not tired of me and the Meris. But this letter has grown to such a length, I fear you will be inclined to throw it into the fire without reading it.

I have no doubt that there are sundry errors in this account; but I cannot stop to correct them, for I feel sure if I were to read over what I have written I should hesitate about sending it. I had not intended sending you the journal up the river, it was copied to send home with sketches; but as you seem interested in the scenery of the Soobanshiri, I have ventured to add it.

Yours very sincerely,

(Signed) E. T. DALTON.

(True Copy,)

(Signed) F. JENKINS,

Agent to the Governor General.

(True Copies,)

J. CURRIE,

Secretary to the Govt. of India.

* Trade with us and with Abors; position of villages; rough estimate of population; Abors, Accas, not yet touched on. All these however might be included in a public letter applying for leave to make a more extended excursion next year.

Notes, principally Geological, on the South Mahratta country—Falls of Gokauk—Classification of Rocks. By CAPT. NEWBOLD, F.R.S. &c. Assistant Commissioner Kurnool.

The reader has already been introduced into the South Mahratta country at its eastern angle near the confluence of the Kistnah and the Gutpurba.* We will now proceed westerly across it, following the right bank of the Gutpurba to the Falls of Gokauk on the Eastern slope of the Western Ghauts, leaving the Kolapore territory to the right.

I crossed the Kistnah about two and a half miles below the *Sungum*, or confluence, and passed up the opposite bank towards the tongue of land formed by the junction of the rivers. The apex consists of silt, sand and clay, in regular layers, rising, as they recede, to the height of about sixteen feet above the surface of the water.

A section of these layers was afforded in the sides of a deep cleft running down to the Gutpurba. They present a striking illustration of the formation of fissures in sedimentary rocks, simply by the mass contracting in consolidation, unaided by subterranean movement or displacement, which we are compelled to call in to our assistance in explaining the great faults and displacements, attended with scorings of the faces of the fissures, and the polishings termed "slickensides," so common in the coal measures, and other old sedimentary rocks of Europe. Earthquakes, another cause of fissures, are unknown here.

The fissures in these layers of silt and clay are usually vertical, and widest in the more consolidated layers; their course is often zig-zag, like that of the celebrated gap in the sandstone rocks of Gundicotta through which flows the Pennaur; or, like the fissures in the *Regur* deposit: during the hot months they frequently intersect each other.

Horizontal seams, independent of the parallel laminæ of deposition, have been formed, partially filled with a titaniferous iron sand, which owes its arrangement, and segregation in distinct layers partly to its greater relative specific gravity, and partly to the motion of the water.

The truth of this is easily illustrated by the simple experiment of mixing intimately some common quartzose sand with a portion of the

* See Journal, Vol. XIII. p. 1004.

iron sand, and throwing them into a tumbler a quarter full of water.

If the tumbler then be inclined to one side, and gently moved so as to cause the water to move backwards and forwards over the surface of the sand, the particles of quartz and iron gradually separate and become arranged in distinct layers.

The upper beds of the section are of loose silt and sand, the lower layers are more consolidated, and towards the base of the cliff thin layers of an indurated liver-brown marl alternate; both the silt and marl effervesce slightly with acids. At the bottom of the fissure runs a rain channel, which has washed the sides into salient and re-entering angles. In some places they have been excavated and undermined by it, and portions of the superincumbent layers have fallen in. In short, we see on this diminutive, yet true scale, all the striking features of precipice, ravine, pinnacle, and castellated form so remarkable in the sandstone and limestone formations.

Tabular cavities appear in many portions of the cliff which have neither been caused by snails, nor other boring conchifers. They have originated from the stems of long grasses, around which layer after layer of silt, &c. had been deposited until the stem decayed away, leaving an empty cavity modified by the action of the rain trickling down it into the substance of the rock. In many of these cavities the grasses are still seen. The iron sand is slightly magnetic, infusible per se before the blow-pipe; and forming with difficulty a blackish slag; it tinges borax of a brownish green. It has probably been derived from the neighbouring trap formation.

The Rivers Kistnah and Gutpurba. The Kistnah near the confluence is apparently about 500 yards broad, and the Gutpurba about 100. The current of the former had a velocity of about two and a half feet per second, and the latter about two and three-quarter feet.

The temperature of both rivers, one foot below the surface, was exactly the same, viz. $76^{\circ} 5'$. Temperature of air in shade 76° ; in sun 84° : month July, river swollen by the monsoon freshes. Mean temperature of the South Mahratta country at Darwar, according to Christie, is about 75° . As both rivers were nearly full, there was no opportunity of examining the size and nature of the pebbles in the bed. On the banks are scattered water-worn fragments of chert, quartz, granite, trap,

felspar rock, hornblende schist, jasper, lateritic conglomerate, kunker, ferruginous clay, greyish blue and sand-coloured limestone, sandstone, and calcedony. None of the fragments that had been transported by the current were more than three or four inches in diameter.

A tumbler-full of the turbid water deposited about 1-20th of its bulk of a fine sandy brown sediment, which effervesced with acids; very different, like those of the Bhima, Godavery, Tumbuddra and Cauvery, from the *regur*, which, as before mentioned, is supposed by some geologists to be a deposit of these rivers. The freshes of the Kistnah do not, according to the testimony of the oldest boatmen, ever overflow the banks more than half a mile; and its inundations at Danoor, and other places where I have crossed it, rarely spread to a greater extent. These facts argue strongly against the theory of the fluviate origin of the *regur* which is seen covering vast flat plains like seas, which extend, I may say, hundreds of miles from the banks of these great rivers. With regard to Christie's theory of its being the detritus of trap rocks, I have before observed that the iron contained in them oxidizes, becomes ultimately reddish or coffee-coloured in weathering, and imparts its colour to the detritus; and that the alluvium we now see brought down by the Kistnah, Bhima, and Godavery, which rise in and flow over the great trap formation, is of a brown colour, very different from the bluish black of the purest *regur*. One of the richest and most extensive sheets of *regur* in Southern India, is that of the Ceded Districts, which is watered by the Tumbuddra, Pennaur, and Hogri rivers, the courses of which on no point touch the trap formation, passing over plutonic and hypogene rocks, sandstone and limestone. If the rich sheets of *regur* which cover the plains of Trichinopoly, Artoni, and Cuddapah had been derived from the great trap formation, one would naturally expect to find in it, or associated with it, grains or fragments of calcedony, agate, jasper, heliotrope, and other hard minerals so abundant in the overlying trap: but there is no instance on record of such fragments having been found in these *regurs*.

The *regur* is seen too, far above the present drainage levels of the country. At Beder, as already observed, both Voysey and myself found it on cliffs nearly 200 feet above the general level of the surrounding country.

The boiling point of water at the Sungum was 200.3. Temperature of air at the time of observation 80°.

On the S. bank of the Gutpurba are some low hills running E. S. E. The only one which was examined proved to be a breccia, overlying the light blue and buff limestone, composed of a dark red or liver brown clay, highly indurated, and passing into jasper imbedding angular fragments of the siliceous portions of the subjacent limestone, chert, quartz, &c. The angular fragments of chert are often so small as to give this breccia the appearance of a porphyry, for which some portions of the rock might at first sight be mistaken, and a bed of really aqueous origin confounded with a plutonic rock—an error which has happened.

Proceeding westerly from the limits of the hypogene schists, the imbedded fragments in this breccia become larger, and the conglomerate character cannot be mistaken. It is evident, from the gradually increasing size of the pebbles, that the rock whence they were derived is neared as we advance west, and that the current which deposited these beds of sand and pebbles must have had an easterly direction.

This inference proved correct; and the limestone was found *in situ* at a short distance west from the hills, on the S. bank of the Gutpurba, in broken-up and dislocated strata; some of the limestone slabs had been furrowed as if by the action of pebbles passing along them in an east and west direction. Dark veins of chert projected every where from the water-worn blocks and slabs of this limestone, many of which are thickly encrusted with depositions of a ferruginous kunker which abounds. The limestone often abounds so much in silex, and is so indurated as to give fire with steel, and hardly effervesces with acids, save in a pulverized state. Marks of aqueous abrasion and plutonic disturbance which preceded the formation of the breccia are very apparent in this locality.

Sitadonga hills. A plain almost covered with *regur* extends from these low hills of breccia to the Sitadonga range, which abutting on and confining the Gutpurba on the north, run down to Badami and Gjunderghur on the south. The hills at this point consist of sandstone and conglomerates, the latter usually the lowest in position, both partially capped by a lateritic conglomerate which, in many places, has evidently been stripped off by denudation. The conglomerates are

often of a highly ferruginous and jaspideous character, and imbedding fragments of chert, quartz, and shales from the limestone.

As these hills are ascended, the sandstone gradually loses its conglomerate character, passing into almost all the varieties it is susceptible of, from yellow and reddish rock containing much argillaceous matter, to a loose gritty sandstone with red and yellow bands, which passes into a compact white sandstone, approaching quartz rock, containing specks of oxide of iron, or decayed felspar, in minute cavities.

On the summit of the Pass was a fine whitish sandstone with reddish streaks, composed of grains of quartz held together by whitish decomposed felspar.

On many of the slabs the ripple mark is distinct, running nearly N. and S., which shows that the current must have had an easterly or westerly course in this locality. At the western base of the Pass the coloured argillaceous shales, into which the limestone usually passes near the line of junction with the superimposed limestone, have been invaded and cut by a dyke of basaltic greenstone, and converted into reddish, greenish, and brown coloured jasper and bluish white chert in alternating layers; each line of which presents the original lines of deposition. Two other dykes, or ramifications, are crossed in the plain or valley extending from the base of the first Pass to another range probably a spur or outlier of the ridge just crossed, and though curvilinear, having a general direction nearly parallel with it. Green argillaceous schists, altered by the basaltic dykes, and in almost vertical laminæ, occupy the bottom of the intervening valley. The spur or outlying range is of a compact sandstone capping the schists and dipping at an angle of about 28° towards the S. W. Near the summit of the range it contains a bed of very fine white and red clay which is extensively excavated by the natives, who use the former as a whitewash and to paint the mark of caste on their foreheads.

The Gutpurba finds its way easterly through a break just below this rock, and rushes through the ridge just passed, by a still narrower and more rugged gorge.

Leaving the excavations, the traveller descends the sandstone spur into the extensive and fertile plain of Bagulcotta, based on limestone and its associated coloured shales and schists; bounded on the east by the Sitadonga or Gujunderghur range; and, as far as the eye can

reach, on the west by the ranges west of Kulladghur, and those of Gokauk on the flank of the Western Ghauts.

Plain of Bagulcotta. This plain continues westerly to within a few miles from Kulladghi, watered by the Gutpurba on the north, and bounded by a long, low, flat-topped range, evidently of sandstone; to the S. the limestone, which bases it, has a general dip of about 25° towards the E. N. E. at Bagulcotta, and a direction nearly parallel to that of the sandstone ranges, viz. N. N. W.; both dip and direction, however, vary occasionally, probably from flexures and disturbance by plutonic intrusion. The limestone in the vicinity of Bagulcotta and Kulladghi is of various shades and textures; sometimes as white and crystalline as marble, and composed almost entirely of carbonate of lime; at others siliceous or magnesian, or passing into whitish, green, blue, red and chocolate-coloured argillaceous shales. At Bagulcotta a pale buff coloured limestone occurs, portions of which might be applied to lithographic purposes; specimens of it I believe have been sent to Bombay for trial, but in consequence, probably, of not being selected properly, have been rejected as too hard, or for being veined.

The site I hardly conceive has had a fair trial; by the sending down a person *practically* qualified to select specimens, and by the quarrying a little deeper than has hitherto been done, I have little doubt that better samples of the stone might be got. Talicotta however, as mentioned in a previous paper, is the most promising locality for lithographic limestone.

The purer white crystalline variety is broken up into small fragments, and burnt into lime. I observed in it the same green chloritic flakes which I afterwards found veining the marble in the quarries of Mount Pentelicus near Athens, and in the Cipolin Marbles. A pale salmon, or flesh-coloured subcrystalline variety, resembling Tiree marble, occurs both near Bagulcotta and at Sullakairy, a village about three miles S. from Kulladghi.

About three miles to the E. of Kulladghi a few low hills of a lateritic conglomerate rest on the limestone and associated shales, running parallel with the sandstone ranges. The cementing substance is partly a calcareous, and partly a clayey paste of a yellowish or reddish colour, imbedding nodules of laterite. The lower portions of this rock are more compact than the upper, and exhibit distinct lines of

stratification. The range on the left, or south, of the road from Bagulcotta to Kulladghi, consists of sandstone and conglomerate. The latter imbeds pebbles both rounded and angular from the harder and more siliceous portions of the subjacent shales and limestone, and also pebbles of an older sandstone, which I did not discover in *situ*; these beds are not inclined so much as the limestones and shales on which they rest, but dip to the same point of the horizon.

Kulladghi. The nullahs in the vicinity of Kulladghi afford good sections of the limestone and its associated shales which, from their highly inclined and bent strata, have evidently suffered much disturbance from plutonic forces. The frequent alternations we see of those rocks, in a very confined area, induces the supposition of the beds having been folded back upon themselves, and thus produced the appearance of a double and reversed alternation, the upper parts of the folded strata having been carried away by denudation, as is seen to be the case on the face of some of the magnificent precipices of the Alps.

The shales are beautifully marked by white, blue, green, yellow, and red coloured bands; and seamed with arenaceous layers. The open seams of the rock are often encrusted with kunkerous infiltrations.

Slate quarries of Katurki. On the Maningpur road near the village of Katurki, about one-half koss from Kulladghi, these slates split into rhomboidal forms by joints, and yield good hones; at Sullakairy tolerable roofing slates, slates and slate pencils are quarried. Sullakairy, as before stated, is about three miles from Kulladghi, on the Gujunderghur road.

The lower beds of the quarried rock at Sullakairy are of a massive blue slate interstratified with a softer lamellar variety, easily fissile, and divisible into leaves which are often not more than a line thick; dendritic markings are frequently seen on the surfaces of the laminæ.

From the more massive beds are hewn large blocks for pillars of pagodas, Hindu idols, &c. Roofing slates are not much patronized by natives, who prefer tiles, thatch or mud, but considerable quantities have been here quarried and sent to the British cantonment of Belgaum and the Portuguese Indian metropolis, Goa. The prices at the quarries, I was informed on the spot, for slates of a foot square and quarter or half an inch thick, are five rupees per hundred slates; they

may be procured however of much larger dimensions, and of any degree of thinness. A capital writing slate and pencil were cut for me out of the quarries, shaped and polished all in a couple of hours.

A loose, friable, dark blue slate in the bed of the nullah near the quarries is sometimes pulverized and ground up with water and used as a blue wash for houses, &c.

Iron Mines of Hirasillaky. Iron ore is procured, according to native information, near the village of Hirasillaky, about two and a half koss from Kulladghi. The metal sells at from two to two and a half rupees the pukka maund of forty-eight seers. Land carriage by bandies or bullocks, and abundance of cheap fuel for smelting are readily procurable.

From want of time and opportunity, my visit to the hone quarries of Katurki was by torch-light, when little was to be made out regarding the thickness or nature of the beds furnishing the Novaculites.

From Kulladghi to the Falls of Gokauk. Proceeding in a W. by N. direction near the right bank of the Gutpurba, towards the falls of Gokauk, over extensive plains of *regur* with patches here and there rendered sterile by saline infiltration (the muriate and carbonate of soda,) the limestone and its associated shales are occasionally seen basing the plains intersected by dykes of basaltic greenstone, of which four were counted between Lokapoor and Hulkoond, about twenty-three miles distant from Kulladghi; to the intrusion of these dykes much of the alteration seen in the limestone is attributable.

A little to the west of Hulkoond the great overlying trap of the Deccan is seen to extend over the surface of the schists, and may be traced nearly to the base of the sandstone cliffs to the south and west, covered by sandstone debris; a few scattered sandstone outliers occur between Hulkoond and Kulladghi.

At Munnikerry, about twenty-six miles from Kulladghi, is a ridge of sandstone, approaching a quartz rock in compactness, intersected by a net work of brown, ferruginous veins. The sandstone is, in some situations, covered with a breccia composed principally of sandstone and quartz in angular fragments cemented by a ferruginous clay.

Close to a small pagoda, the sandstone at the S. W. flank of the ridge near the edge of the overlying trap is penetrated with a vein of black manganese, associated with iron, about three inches broad.

At Bugganala, about two and a half miles westerly from this sandstone ridge, the limestone and shales are again seen dipping N. 20° E. direction of strata E. 20° S., layers and veins of a reddish jasper and chert intersect the limestone, a phenomenon that is usually seen where the limestone comes in contact with plutonic or hypogene rocks.

Farther west, between Bettighirry and Ooperhutti, a bed of quartzly talcose schist, approaching protogine, is crossed with layers of lithomarge.

Nearer Ooperhutti, the overlying trap is again seen in low cliffs on the banks of a nullah, resting on a red amygdaloid, which contains layers of a fine red bole with a shining streak, and conchoidal fracture. It does not adhere to the tongue; falls to pieces in water; does not form a plastic clay.

The trap is associated with wacke, with green earth in nests, and a chocolate amygdaloid reticulated with strings of calc spar, and imbedding calcedony and zeolites.

A loose sandstone, associated probably with the laterite, and newer than that which has just been described, rests in horizontal partial layers on the trap, of which it imbeds small fragments.

On approaching the sandstone ranges of Colabanghy and Gokauk, the hypogene schists are seen rising to the surface at their base, and the intervening limestone and its associated shales are wanting. The hill of Punchmi to the S. W. of the town of Gokauk has a base of garnitiferous gneiss, hornblende and chloritic schists, capped with sandstone in massive beds. These beds are interstratified with layers of conglomerate containing rounded and angular fragments of reddish quartz rock, quartz, and a greenish and grey chert. These fragments in many instances appear to have been deposited so tranquilly as to have been arranged agreeably to the laws of gravitation, and occur most frequently at the seams of the thick sandstone beds.

The hypogene rocks have a dip of about 60° towards the E. by N., direction of beds S. 5° E. The sandstone rests on it unconformably,

dipping but slightly in the same direction. A dyke of basaltic greenstone, of about five feet broad, penetrates the hornblende schist in an easterly direction, bifurcates at about the middle of the ascent from the N. E. and is lost in the substance of the rock.

Falls of Gokauk. The subordinate ranges of Gokauk and Cota-banghy now before us, form the eastern flank of the Western Ghauts, and run in a parallel direction, here about S. by E.. At Gokauk the upper portions of this range present mural precipices with either well flat tabular summits, or running in narrow crested ridges.

They are entered from the east by a picturesque gorge (cross valley), through which the Gutpurba hurries from its mountain sources into the elevated plains of the Deccan, near the town of Gokauk, which is about three and a half miles easterly from the falls.

The road lay along the bottom and side of this defile on the right bank of the river, which was now (July) swollen by the monsoon freshes from the Western Ghauts. It varied in breadth from 90 to 300 yards, presenting a rapid muddy stream, brawling and rushing from the alternate confinement and opening out of its rocky channel. It is unfordable generally during four months in the year at Gokauk, viz. from the middle of May to the middle of September, at the cessation of the monsoon. The water at the dry season ford, a little below the town, is now 15 feet deep. The sources are said to be near Bunder or Gunder Ghur, a little N. of the Ramghaut Pass from the S. Concan to Belgaum. After a course of about 100 miles, watering the plains of Kulladghi and Bagulcotta, it finds its way through the gaps in the Sitadonga hills just described, to the Kistnah, which it joins at the *Kudli Sungum*.

After an hour's time spent in winding up this rugged defile, the falls, the roar of which we distinctly heard during the silence of night at the town of Gokauk, at a sudden angle of the road became partly visible, presenting the magnificent spectacle of a mass of water containing upwards of 16,000 cubic feet precipitated from the tabular surface of the sandstone into a gorge forming the head of the defile, the bottom of which is about 178 feet below the lip of the cataract. The Gutpurba a little above the fall is apparently about 250 yards across, but contracts to 80 as the brink of the chasm is approached; consequently the density and velocity of the watery mass is much increased, and

it hurries down the shelving tables of rock with frightful rapidity to its fall.

The fall over the face of the precipice seems slow and sullen from the velocity of the surface water of this rapid, and from the great denseness of the body; and it plunges heavily down with a deep thundering sound, which we heard during the previous night at our encampment, three and a half miles farther down the river.

This ponderous descent, and the heavy muddy colour of the water, conveys a feeling of weight through the eye to the senses, which is relieved by the lightness and airiness of thin clouds of white vapour and amber-coloured spray which ascend from the basin at the bottom of the gorge in curling wreaths, curtaining the lower portions of the fall, and through which the basin was only seen at intervals when its surface was swept by the fitful gusts that swept up the glen.

Rising above the cliffs that confine the falls, the watery particles vanish as they ascend; but again condensing, descend in gentle showers, which is felt at a short distance round the head of the falls.

Spray bows, varying in brightness, distinctness and extent, according to the quantity of light refracted, and the modification of the vapour, lent their prismatic tints to the ever-ascending wreaths; the largest, (observed about 4 P. M.) formed an arch completely across the river, rose, and receding as the sun sank in the west, gradually disappeared with it. Like the rainbow they are only produced on the surface of the cloud opposed to the sun's rays. The size and distance from each other of the drops composing the different portions of the spray cloud, evidently influenced the brilliancy of the refracted colours, the tints being brightest in those portions where the drops were of medium size and density, and dullest where the watery particles were smallest and closest together.

The velocity of the surface water of the rapid was about nine feet per second, and its depth ten feet. About two and a half miles farther up, the river near the village of Koonoor, beyond the rapid, is a ford in the dry season, and a safe ferry during the monsoon. A tumbler-full of the turbid water deposited 1-50th of its bulk of a fine reddish clay, not calcareous,—a fact showing that the lime which exists in the sediment of this river at its confluence with the Kistnah, must have been derived from the intermediate plains. The pebbles brought down are chiefly

quartz, granitic, and from the hypogene schists, with a few of calcedony; the sands containing grains of magnetic iron. The boiling point of water at the plateau of sandstone from which the cataract falls, gives 2817 feet above the level of the sea.

The mean temperature of the place, approximated by Boussingault's method, is 78°, which I should think rather too high, as the temperature of a spring close by was only 75°. Temperature of air in the shade at time 78°.

The mean temperature of Darwar, which stands much lower, is calculated by Christie at 75°.

The head of the fissure, which is elliptical in form, with mural sides of sandstone, has much the appearance of having been cut back, like Niagara, by the abrading action of the water, for the space of about 100 yards. Large rocks, with angular unworn surfaces, evidently dislodged from the rocks on the spot are seen in the bed, and on the sides of the river below the deep basin-receptacle of the fallen waters and on its margin. The great hardness and compact structure of the sandstone above the falls offers great obstacles to their rapid recession.

The cliffs, however, flanking the right side of the river below, are rent by nearly vertical fissures from summit to base, by one of which I descended to the bed. The direction of two of the largest was about E. S. E. They are crossed nearly at right angles by minor cracks which thus insulate portions of the rock. The bases of these tottering pinnacles are often undermined by the action of the water, and the mass tumbles headlong into the stream.

The sandstone in its lower portions is interstratified with layers of shale, the softness of which facilitates this process of undermining. These shales are of a purplish-brown and yellowish-brown colour, with minute spangles of mica disseminated, and between the laminæ contain incrustations of common alum (sulphate of alumina). The alum is earthy and impure, and sometimes has a mammillated surface resembling the alum incrustations in the ferruginous shales cresting the copper mountain near Bellary. It is found in considerable quantity in a small cave near the foot of the falls.

The ripple mark, so often seen on the sandstones of Europe, is observed in great distinctness on the tabular surfaces of the cliffs and in the exposed layers of the subjacent beds, at least 100 feet below the

surface. Its longitudinal direction is various, but generally S. 25° W., indicating the E. S. E. and W. N. W. direction of the current which caused them. The ripple marks on the sandstones of Cuddapah and Kurnool have a general similar direction.

At the bottom of the deep fissures in the sandstone cliffs already described, accumulations have formed of fallen fragments of rock, sticks and leaves, &c. from above, intermingled with the dung and bones of bats, rats and wild pigeons, with a few sheep and goat bones. Some of the latter have the appearance of having been gnawed by hyenas, jackals, or other beasts of prey. Many however are evidently the remains of animals that have fallen from above, as the bones are fractured.

The upper portions of these fissures have sometimes been choked by rock and rubbish from above. Their sides, though generally smooth, are marked with shallow polished grooves.

I made two excavations through the floor of the principal fissure, in the hope of meeting with organic remains, but in vain. After penetrating the surface layer of loose stones, and bats' dung, a fine red earth was met with, imbedding angular fragments of sandstone, and a few rounded pebbles of it and quartz. After digging for about four or five feet through this, farther progress was prevented by great blocks of solid rock.

The seeds of creepers and other plants vegetate on this soil, and shoot rapidly towards the surface, shading the fissures with their leaves.

On the cliffs near the falls, on the right bank of the river, stands a small group of Hindu temples dedicated to Siva. The principal shrine is a massive and elaborately carved structure of sandstone, elevated on a high, well built pediment above the reach of the ordinary floods.

Seven years ago, three of the steps of the northern flight ascending this terrace were submerged by an extraordinary rise of the river. The *Vimana* of this temple contains the Phallic emblem of Siva, the *Linga*, guarded by the sacred bull. Here we passed the heat of the day. On the opposite bank of the river rises a well wooded hill, about 100 feet above the brink of the rapid, on which stand a few ruins of other Hindu religious structures.

The table-land to the S. of the falls is covered with low jungle of Mimosa, Euphorbia, Cassia and Bunder, the *Mend bundati* with its lilac sweet pea-like blossom, the *Carissa spinarum*, *Webera tetrandra* and other thorny shrubs. The *Euphorbia antiqua* and *tortilis* were in flower, (July).

Tract between Gokauk and Belgaum, along the Western slope of the Ghauts. From the falls of Gokauk by Padshahpoor to the cantonment of Belgaum, about $34\frac{1}{2}$ miles, the route lies nearly S. W. across an elevated table-land sloping gently to the eastward, covered with alternating bands of red and black soil, generally well cultivated, and intersected from Padshahpoor, which is about $11\frac{1}{2}$ miles from the falls, to Belgaum by curvilinear spurs and outlying hills, belonging to the Western Ghaut system, consisting of sandstone and sandstone conglomerates as at Gokauk, in nearly horizontal strata. The ruins of the fort at Padshahpoor stand on a low flat-topped hill of this sandstone. This formation has been covered in two localities by the overlying trap. A little beyond the village of Kunnoor, about two miles from the falls, a narrow *coulee* of trap is crossed, containing olivine and dark glassy crystals of felspar.

About a mile to the N. E. of Belgaum, another sheet of trap is entered on, which extends to the sandstone ranges on the right. The sandstone is now finally lost sight of on the line of route, and the trap continues the surface rock to Belgaum, where it is covered by a thick bed of laterite, over which is in some places superimposed a layer of the more recent lateritic conglomerate.

Sections of these rocks are afforded by the quarries near the old European Barracks, none of which have been excavated to the subjacent trap. It has however been dug down to in some of the deepest wells of the place. The laterite is used here as at Malacca, Goa, and on the Malabar coast, as a building stone.

The trap in the vicinity of Belgaum rises into hills with rounded summits, covered in general with a dark, spongy mould, which is boggy during the monsoon, the grassy and almost treeless surface of which affords a strong contrast to the jungle-covered hills of sandstone to the N. W. The trap hills are rarely flat-topped, or in horizontal ranges,

as seen in the more central parts of its area. The trap at the summit of these hills is usually dark, compact, and basaltic, but occasionally contains almond-shaped and spheroidal cavities filled with calcedony and crystallized quartz, zeolites and green earth. Black crystals of augite are occasionally seen shooting through its structure, which decay sooner than the imbedding rock; and, falling out in the state of powder, leave numberless cavities on the surface. The rock itself in weathering, resembles iron in rusting, and passes into reddish brown, or coffee-coloured earth, or clay. Cavities occasionally are seen filled with a black earth resembling black bole.

S. E. boundary of the overlying trap at Bangwari. This trap passing into amygdaloid and wacke, and covered with patches of laterite, extends about fourteen and a half miles S. E. from Belgaum, a little to the West of the village of Bangwari, though a few narrow slips are crossed a few miles farther East. The edge of the trap is seen reposing on the hypogene schists at the base of the trap hills close to the village, the ferruginous quartzites with veins of a diaphanous bluish quartz and hornblende schists, are here seen to be set out in nearly vertical strata.

From the Southern limit of the overlying trap at Bangwari to the Malpurba. A few hundred yards to the W. of the village of Hoobly, sixteen and a quarter miles S. E. from Belgaum, there is a low hill covered with alluvial soil, in which I found an angular block of quartz with a fibrous structure resembling that of silicified wood, but evidently not of organic origin. The exterior is brown and opaque;—interior generally translucent with microscopic longitudinal cavities. Minute longitudinal fibres of talc are discoverable with the aid of a lens, having a parallel direction with those of the fibres of quartz, and I have little doubt that the rock owes its fibrous structure to the presence of talc. I have observed a similar structure in the quartzite associated with the talcose and actynolitic schists of Mysore.

Malpurba River. About three-quarters of a mile from Hoobly the Malpurba is crossed. It was swollen by the monsoon (July) and unfordable, having about eighteen feet of water in the main channel. Rate of surface current, two and a half feet per second. Its breadth by a trigonometrical observation ninety-five yards. A tumbler-full of the water

deposited a scanty sediment of fine red silt, about 1-50th part of its bulk. The temperature of the water a foot below the surface was 74°, of air in shade 72°, of a well thirty feet deep 74° 5'. The temperature of rain water 73°. (The atmosphere had then been cooled to 70° and 74° by eighteen days of successive rain, with a pretty steady westerly wind). The banks of the river are of silt and sand, the left or Western bank is steep and high.

From the Malpurba to Darwar. From the banks of the Malpurba to Darwar, a direct distance of twenty-three miles, the country is hilly and picturesque, particularly around the Marhatta forts and towns of Kittoor and Taigoor, which command a lovely *landscape* of hill and dale. The valleys are generally well watered, cultivated with dry and wet grain, and studded, parklike, with clumps of the Mango and Tamarind, while the sloping sides of the hills, verdant with the rain, afford a plentiful pasture to flocks of sheep and herds of cattle. The landscape around Darwar partakes of the same character, and was frequently brought to recollection during subsequent wanderings in Karamania, the Troad, and other parts of Asia Minor.

The soil covering the surface of this pleasing tract of country, is usually reddish, and the result of the decay and washing of the neighbouring rocks. A few belts of cotton soil appear here and there. The staple products of these soils are rice, yellow and white Juari, Bajra, Raggi, Teingoni, Till, Tobacco, Saffron, and Maize; Mimosa, Euphorbia, Cacti, Cassias, and Acacias constitute the majority of the wild vegetation.

The schists forming the hills in the vicinity of Kittoor resemble, petrologically, the jaspideous schists of Bellary and Sondur (described in Madras Journal for July 1838, pp. 147-49,) and consist commonly of chert and brown iron ore, or a ferruginous jaspideous clay in alternate layers; sometimes in straight lines, sometimes in flexures contorted, or bent at acute angles, and resembling those of ribbon jasper. This rock, like that of Sondur, is sometimes magnetic with polarity. It contains nests and cavities lined with blistery and stalactitic hematite, quartz crystals, and veins of smoky quartz. In some places, like the Sondur rock, it puts on the appearance of a breccia consisting of a dark chocolate, or liver-brown paste, highly indurated, giving fire with steel, imbedding angular fragments of the striped ribbon jas-

per-like variety, and appearing, as Christie justly describes, as if the latter rock had been broken into a number of small angular fragments, which had been afterwards united by the consolidation of the brown variety. I have seen this singular phenomenon most beautifully exhibited in some specimens of a continental agate breccia in the collection of Mr. Robert Brown, the celebrated botanist, where angular fragments of beautiful jasper and agate are united together in highly transparent quartz. The pieces of agate and jasper must evidently have been once continuous, and re-united on the spot where they were fractured; since, in most instances, the sides of the fractured portions are sharp and angular, and could be refitted into each other with perfect exactness; some are only separated a tenth of an inch by the transparent medium in which they are set. The differently coloured bands identify the fractured portions as having once constituted one integral piece of jasper or agate.

If the reader can imagine a flat piece of ribbon-jasper or agate laid down upon a table, and both broken, so that the fractured portions shall not be scattered widely from their neighbours, and a layer of molten glass carefully poured over them, he may form an idea of the appearance of these beautiful breccias. He must not expect, however, to see such regularity in rocks on the large scale.

Towards Darwar the schists pass into chloritic and argillaceous slates and shales, of all shades of white, yellow, red, brown, and green; interstratified with beds of quartz rock, and the jaspideous rock just described, which generally forms crests and mural ridges on the summits of the hills. The latter is often found in irregular masses, obscurely stratified; but, in most cases, as remarked already, in regularly interstratified beds with the clay and chloritic schists conformable both in dip and direction.

The lustre of this rock is sometimes equal to that of pitchstone, and sometimes dull and earthy; the fracture flat conchoidal, in the more compact varieties; splintery and slightly granular in the less compact. The Kittoor and Darwar schists bear evident marks of the alternation produced by the intrusion of granite, and trap dikes seen occasionally at the bases of these hills; and as in the Ceded Districts, and other localities on the hypogene area, of Southern India, affords striking illustrations of the correctness of McCulloch's remark on the formation

of jasper rock,* viz. "where strata of quartz rock, containing much felspar or clay occur in contact with granite, they pass into jasper if the clay abounds; while in other places they are converted into chert if less of that earth is present; or, if pure, are rendered perfectly crystalline."

With regard to the classification of jaspideous rocks associated with the metamorphic schists of S. India, it is clear they either belong to the jasper rocks, or silicious schists of McCulloch, both of which, however, I have reason to think, pass occasionally into each other. Both occur in strata among the metamorphic rocks; jasper sometimes forming hills in Siberia and Norway, and it is seen in Scotland and the Apennines imbedded in micaceous and argillaceous schists.

The difficulty that sometimes exists of distinguishing these two rocks has not escaped the notice of McCulloch, who thus remarks: "Jasper presents a few modifications of internal structure which require notice. It sometimes gives indications of a spheroidal concretionary disposition, more or less perfect, and resembling that which, under circumstances of a similar nature, occurs in chert and silicious schist. In the same way, it sometimes possesses a laminar structure, and in this also it approximates to the silicious schists. It is easy to see how from similarity of origin, connexion and composition, it may be thus a matter of doubt to which of those two rocks any given specimen or bed should be referred. The well known striped and spotted jaspers owe their appearance to the two structures above-mentioned, and occasionally the two are combined in the same specimen."

There is however a perhaps somewhat empirical distinction drawn by some geologists between these two classes of rocks, founded upon the supposed less stratified character of jasper, its intrusion into other rocks in the state of veins, and its association with trap rocks, which I will avail myself of to place, pro-tempore, the jaspideous rocks of Southern India among the silicious schists; from their, in general, decidedly stratified character, particularly those of the Southern Marhatta country, which pass into the associated schists, and preserve a conformable dip and direction. The petrographical characters of the Marhatta beds, varying according to the degree of induration, and

* Classification of Rocks, pp. 546-47.

structure, on the whole less assimilate those of jasper than in Sondur and other places. The generality of its most jaspideous and laminar beds may be classed in McCulloch's second division of silicious chert, viz.

"F. Laminar, with alternate colours, and forming varieties of the striped jasper of mineralogists. The colours are commonly shades of red, brown, yellow and purplish black, and these kinds appear to be derived from the coloured shales.

"G. Containing imbedded crystals of quartz, and of a porphyritic aspect."

The physical aspect of the country to the W. and S. W. of Darwar is hilly. The elevations are generally, like those of the clay slate of the Cambrian group, round-backed, smooth, of no great altitude, and separated by well cultivated vallies, or narrow ravines. They are partially covered with a low shrubby vegetation principally of *Mimosa*, *Cacti*, and the *Cassia auriculata*. To the East stretches the great plateau of the S. Mahratta country and Ceded Districts, covered for the most part with a thick layer of *regur*, and continuing, with but few hilly interruptions, across the peninsula to the Eastern Ghauts. The soil in the immediate vicinity of Darwar is reddish and clayey, evidently the alluvium of the schistose hills, and disintegration of rocks in *situ*.

The rocks composing the hills are schists passing into slates and shales, (agreeably to Lyell's distinctions of these terms.) The general structure is perhaps more schistose and shaly than slaty. The structure varies from massive, and obscurely slaty, to finely laminar; and from compact and flinty, to soft and sectile. The laminae are nearly vertical, and generally run parallel with the prevailing line of elevation, viz. N. W. and S. E. The stratification, if not identical with the lamination, is obscure. It is well known, however, that the lines of fissility in slates are not necessarily those of stratification, the former being often caused by the arrangement of mica, chlorite or talc; petrographically speaking, the rock passes from a green chloritic schist into all shades of white, yellow, red and brown, sometimes singularly arranged in stripes, in contorted and waving bands; red and white being the prevalent tints. Felspar, in a clayey slate of disintegration, is the prevalent mineral blended with quartz, and tinged with iron. The white

varieties seldom contain silex sufficient to give them the character of *Kaolin*. The whole mass is sometimes reticulated by veins of a brown ferruginous quartz and impure iron ore, (often split in the centre, and the sides of the fissure lined with quartz crystals) having apparently no decided direction. Iron pyrites are seen in the chloritic schists; this rock, particularly in the vicinity of trap dykes, has a tendency to the prismatic and rhomboidal forms, in which the lamination, though generally obscure, is sometimes still distinctly traceable. A system of joints running nearly at right angles with those of lamination, often intersect the whole group of these schists. These jointed portions are not capable of that indefinite subdivision into similar solids by which Professor Sedgwick justly observes, the true cleavage planes may generally be distinguished from the joints. The difficulty in the schists of the S. Mahratta country is to discriminate between the planes of cleavage, and those of mechanical deposition, or chemical precipitation, for which there are three good tests, viz. the interstratification of another bed of rock, the coloured bands of successive deposition, and a peculiar, but slightly dimpled appearance on the surfaces of the planes never seen on those of cleavage. From the occurrence of the latter on the planes of the laminæ of the Darwar rocks, and from the iron and dip of the large interstratified beds of quartz and silicious schists, I am inclined to consider that the true lines of stratification run nearly parallel with that of elevation, viz. nearly N. W. and S. E., and that the laminæ are those of deposition; while the microscopic fissures by which the rock is cleft into rhomboidal and prismatic forms may be received as those of true cleavage.

My friend Captain Allardyce, who has minutely examined the rocks about Darwar, writes me that the direction of the laminæ and that of stratification keep very constant to one point of the compass, viz. N. W. by N. for a great distance, perhaps over an area of from fifty to one hundred miles. One may pick up a fragment of chlorite slate of a triangular, pyramidal outline, the external planes of which will be ferruginous, while the interior is divided into minute laminæ *not* ferruginous, and coincident with only one of the planes. On examination of the rock in sitû, this minute lamination is found to be vertical, and invariably divided N. W. by N., conformable, in short, to the line of elevation. The chloritic schist N. of Darwar is of a bluish green tinge,

greasy to the touch; and sometimes so massive in structure as to make an excellent building stone, although it rarely loses its slaty fracture. Thin pieces, *per se*, before the blow-pipe, fuse partially on the edges into globules of a greenish-coloured enamel.

It is often intersected by ferruginous quartz veins, or rather layers, that, penetrating the lateral joint seams, and the almost vertical layers of stratification, divide the rock into cuboidal masses. Veins of a reddish grey or white kunker, both friable and compact, occur.

Country S. of Darwar to the Mysore and Canara Frontiers. From the hills of Darwar to the Mysore frontier near Bunwassi and Chundergooty, the face of the country presents a plain diversified with a few mammiform and smooth conoidal truncated hills, which do not rise to any considerable height. The soil is generally reddish and alluvial, crossed in an easterly direction by narrow belts of cotton soil. The formation is much the same as at Darwar. Dykes of greenstone and beds of kunker now become more frequent. A large deposit of the latter is crossed on the road between the old town of Hoobly and the German mission house, about fifteen miles S. E. from Darwar. The wells near are often brackish, and so deep as seventy feet. Both Hingari and Mungari crops are cultivated. Rice too is grown in some of the moist, shallow vallies and flats below the small tanks, which now become more numerous.

Bunwassi and Mysore Frontier. Towards Bunwassi quartz rock prevails with greenstone dykes, having a general easterly direction often covered by beds of laterite and lateritic conglomerate imbedding fragments of quartz rock in a cellular brown ferruginous paste. This rock has been employed in the construction of the wall enclosing the quadrangle of the ancient temple and the old temple at Bunwassi. A little farther South rises from the schists the lofty rock of Chundergooty in Mysore, a mountain mass of granitoidal gneiss divided by vertical and almost horizontal fissures.

From Bunwassi to Gudduk. From Bunwassi, E. N. Easterly to Savanoor, the chloritic and coloured schists and slate clays continue. Near the latter place dykes of greenstone become more frequent, accompanied by depositions of *kunker*, which is seen filling fissures in the schists, and overspreading their surface beneath the alluvial soil. The direction of the beds at Savanoor suffers a deflection after

leaving Darwar of about 40° , being nearly due N. and S., dipping at an angle of about 40° towards the East. They terminate on the N. E. between Savanoor and Gudduck, close to Lackmaisir. Here a spur from the principal N. and S. line of elevation runs nearly E. and W. dipping towards the S. ; several similar spurs are crossed between Bunwassi and Lackmaisir ; the dykes of greenstone run in a similar direction. The schists, in the vicinity of the dykes, are indurated, silicious, and often abound with iron. Crystals of liver and brass-coloured iron pyrites are scattered through its structure ; cotton soil alternates in these strips with the red clayey alluvial soil ; it was first observed W. of Bankassur, near which the vegetation peculiar to the W. Ghauts terminates rather abruptly.

At Lackmaisir, gneiss is seen on the bank of a nullah running nearly E. and W. with a dip of 35° towards the S., and farther N. it rises into a low round backed ridge. Proceeding still more N. granite occurs in low bosses and detached blocks, and rises into a few clusters at the town of Kul Mulgoond. Near Hurti, on the S. flank of the Kupputgode range, resting on the gneiss, is a hill of mammiform shape, having its surface covered with detached, angular, and rugged masses of a calcareous rock, which appear to have been subjected to the action of violent disruptive forces. It is very liable to be mistaken, from the colour, hardness and granular texture, for a variety of the massive chlorite schist we have just left behind ; and in some hard specimens it resembles diallage and serpentine. The mass of it however, on the application of a lens, clearly exhibits its true aggregate character : it is composed of minute angular fragments of a dark glistening quartz, and crystals of a pale flesh-coloured felspar, cemented by a greenish, granular subcrystalline paste, composed principally of carbonate of lime, and containing disseminated scales of mica. The application of dilute nitric acid to the rock excited but a feeble effervescence ; but from the powder, the extraction of carbonic acid gas was abundantly evident. Like the chlorite slate, it imbeds cubical, brass, and liver-coloured iron pyrites. Before the blow pipe, *per se*, it phosphoresces slightly, and exhibits, on thin edges, shining points of black enamel. The compact varieties of this rock are susceptible of a high polish, and are used for ornamental architecture. Some of the finely polished slabs in the

elaborately sculptured mosque in the town Lackmaisir appear to be of this stone, retaining, like lapis lazuli, the pyrites which shine like so many spots of gold in its polished surface. In weathered surfaces of the rock these crystals are often seen projecting. It is not unlike some varieties of the celebrated calcareous *breccia di verde* of Egypt.

From its massive character, and want of a proper section, I could not find whether it was interstratified with the gneiss, or rested unconformably upon it. Gold-dust is found in the Nalas of Hurti, of Soltoor, and of Chick Mulgoond.

Beyond this singular hill runs a dyke of greenstone E. by S., which is crossed on the road, and also a range of chlorite and clay slate hills crested with ferruginous silicious schist, having a similar direction. Passing this, the country slopes northerly to Gudduck where gneiss and felspar rocks continue.

From Gudduck E. to the Ceded Districts, and N. to Gujunder Ghur. From Gudduck easterly to the Tumbuddra and the Ceded Districts, the formations consist of gneiss, hornblende slate and granite; and from Gudduck westerly to Darwar, first gneiss and hornblende slate; succeeded, about seventy or eighty miles E. of Darwar, by chlorite and coloured schists and shales. North of Gudduck the hypogene schists and granite extend to Gujunder Ghur, where they are covered by the sandstone beds.

Kupputgode Hills. The Kupputgode range presents an example of one of the crop dislocations which traverse the table-land of the peninsula in a direction from, E. by S. to E. S. E. often influencing the courses of the large rivers which, rising in the Western Ghauts, flow over the table-lands through gaps in the Eastern Ghauts to the Bay of Bengal. It commences a little south of Gudduck, and proceeds in a curvilinear direction easterly, until a little W. of the village of Kuddumpore where it bifurcates; the principal branch taking a S. 25° E. direction to the Toombuddra, which flows through a wide gap, and is continued into the Ceded Districts by Harponhully. The northern branch pursues an easterly course towards Dummul, where it traverses a wide plain extending as far as the eye can reach to the N. E. The strata dip near Gudduck towards the N. at an angle of 35°. Those of the southern chain, below the bifurcation and change in the direction,

dip E. 20° N. direction of strata S. 20° E. The dip frequently varies with the flexures and contortions into which the hypogene schists have been thrown. In one of the highest peaks it appeared quâ quâ versal; and near the temple to Kupput Iswara, whence the range derives its name, I found the dip to the S. W.

An immense dyke of basaltic greenstone emerges from the base of the strata near the point where the range suddenly bifurcates, accompanied, as usual, by large deposits of *Kunker*, which fill most of the seams and fissures in it and the adjacent rock. Considerable tendency to silicification is observed; the schists are profusely veined with quartz of different hues, white, pinkish, and diaphanous blue, reddish, smoky and black; seams and large veins of basanite also occur.

The Kupput hills are principally composed of hornblende and chloritic schists, gneiss and mica slate; large interstratified beds of silicious and ferruginous schists, as at Darwar, often forming thin ridges; seams and thin beds of a crystalline white marble occur; which, near their junction with the hornblende slate, are often coloured green. On the flanks of the range, at the base, gneiss invaded by granite is seen, both quartzose and felspathic, containing rose-coloured quartz and felspar. Near Dummul the gneiss is often so much weathered as to resemble sandstone; schorl and actynolite are usually seen in the quartz veins, which intersect it. The dip of the gneiss is nearly vertical at Dummul, in other situations it varies almost to horizontal; some of the hills are capped with laterite, resembling that of Sondoor. The beds of the Dhoni rivulet, which has its rise in these hills, contain gravel and sand, in which gold-dust is found associated with magnetic iron sand, menaccanite, iron ore, grains of platinum, grey carbonate of silver, grey carbonate of copper, &c. Manganese is also found in considerable quantities. Tippoo excavated pits for gun-flints, of which I have given a description elsewhere.* Potstone occurs with the talc schist in this vicinity, and is used by the natives in sculpture, for cooking vessels, and for giving a smooth surface. The occurrence of gold, silver, copper, platinum, and manganese seems to have escaped the observation of Christie, Marshall, and other writers on the

* Madras Journal of Literature and Science for January 1840, p. 42.

S. Mahratta country; and there doubtless exist many other minerals in its rocks now unknown, but which the researches of other and abler pioneers than myself, and with more leisure, will not fail to elicit.

Geographical position and extent of the various Rocks of the S. Mahratta Country.

Hypogene Rocks. Commencing on the South, we find the greater portion of our area occupied by hypogene schists and argillaceous shales and slates, reaching on the North from Gujunder Ghur from the edges of the limestone and sandstone tracts; and at Bangwari, fifteen miles S. E. from Belgaum, baseting from beneath the overlying trap whence they extend by Darwar and Kittoor, forming the base of the Western Ghauts, and underlying the laterite of North Canara to the Sea on the West, stretching into Mysore on the South, and into the great plains of the Ceded Districts and Hyderabad on the East.

Near the N. W. angle they are seen outcropping from the sandstones near Gokauk as a *salbande* at the edges of the overlying trap formation along the N. bank of the Kistnah, in narrow zones along the Western base of the Sitadonga hills. They are seen with granitic rocks on the summit of the Ramghaut, and below it hornblende schist occurs on the sea shore at Vingorla.

Extent of the Limestone and Sandstone Beds.

The Limestone. The Southern boundary of the limestone and its associated shales has not been traced with accuracy, but we find it four or five miles S. of Kulladghi.

On the North Eastern extremity it emerges from the overlying trap near Talicotta, is capped by sandstone at Mudibhal, but re-appears in the valley of the Kistnah at Chimlaghi. A little to the S. W. it is again overlain by the great mass of sandstone forming the Sitadonga hills, but again is seen forming for the most part the base of the great plains of Kulladghi and Bagulcotta, and stretching to the West to the sandstone ranges of Gokauk and Padshapoor which bound it to the West, while the northern edge is fringed irregularly along the banks of the Gutpurba by the overlying trap.

Extent of the Sandstone. The sandstone and conglomerate ranges usually skirt the great limestone plains as the sand and gravel shores

environ the bed of some dried-up inland sea, and this appearance is heightened by the bold, flat-topped headlands and receding bays presented by the sandstone ranges in their curvilinear outline. This continuity of these long horizontal ranges, which usually preserve an uniformity of height, rarely exceeding 300 feet, has however been greatly violated by, apparently, denudatory aqueous causes; and it is not uncommon to see outlying masses and short ranges of sandstone at considerable distances from the principal deposit, for instance the detached rocks of Noulgoond, Pedda and Chick Nurgoond, (where it occurs in scarped masses cropping granite and the hypogene schists,) and the detached central range between Kulladghi and Gokauk.

The Sitadonga hills form the eastern fringe to the district, and those of Gokauk the western, extending southerly from its northern limits on both sides of the limestone plain of Kulladghi and Bagulcotta to about the latitude of the Malpurba river. The subjacent limestone thins out, or is entirely wanting at the edges, where the sandstone is often seen resting immediately on the granite and hypogene schists. The eastern ridge of sandstone turns westerly near Gujunder Ghur.

Extent of the Laterite. Laterite is seen capping some of the sandstone hills of the Sitadonga range, and a narrow belt along its eastern flank. It also occurs in the form of low hills and patches overlying the limestone in the plains of Bagulcotta and Kulladghi.

In the Southern parts of the district it occurs in a few patches covering the hypogene schists of the Kupputgode range, and on the summits of the Ghaut ranges West of Belgaum and Darwar.

Extent of Kunker. Kunker is pretty generally distributed; there are beds near Badami and Hoobly, of some extent, covered by alluvium.

Extent of the Regur. This remarkable soil, or deposit, for so I consider it, resembles much the *Tchornoï Zem* covering the steppes of Russia; it prevails almost exclusively in the plains East of Darwar, and those of Kulladghi and Bagulcotta, except where interrupted by chains of hills, and covered by the alluvium washed from their sides, in beds from a few inches to thirty or forty feet deep.

Extent of Plutonic and Trappean Rocks. Plutonic rocks are rarely seen developed in any extent on the surface of the South Mahratta country, but their effects are sufficiently apparent in the altered state of many of the lower rocks.

Granite is seen in bosses and rocks near Lackmaisir, at Gujunder Ghur and Noulgoond, underlying the sandstone at Mulgoond, in the gneiss of the Kupputgode hills, at Gudduk and Dummul, and in the districts bordering on the Tumbuddra and East of Gujunder Ghur.

The largest dykes of basaltic greenstone, which I observed, were at the West base of the Sitadonga hills, and in the Kupputgode range.

Extent, &c. of Overlying Trap. The southern margin of the great sheet of overlying trap, which overspreads almost the whole of Central and Western India and the Concan, runs across the northern part of the South Mahratta country, covering all rocks except the laterite, kunker, and regur, all which overlie it: entering from the Nizam's territories by Firozabad on the Bhima, it descends to the Kistnah near Churilaghi, near its confluence with the Gutpurba and follows with some irregularities the northern bank of the latter river by Kotabangy, a little to the N. of the falls of Gokauk to the W. Ghauts and the sea, which it reaches a little N. of Malwan.

The narrow zone of oliviniferous trap, crossed between the falls and Koonoor, possibly connects the outlier of this rock on which Belgaum stands with the main *Coulee*.

North of the Kistnah the trap spreads over the Kolapoor, Sattarah, and Poonah countries; to the N. E. it covers the plains of Bijapore and the Nizam's territories, stretching towards Gwalior. Where the trap terminates to the W. of Belgaum is not exactly ascertained, as the summits of the Ghauts near the Pass down to Vingorla are composed of granite and the hypogene schists; but the river Gutpurba, as has been observed already, brings down a few calcedonies to the falls of Gokauk. The amygdaloid noticed at Bangwari, and in the vicinity of Belgaum, appears to have escaped the observation of Christie, who states he has not seen this rock *in situ*.

Classification of the Rocks of the South Mahratta Country.

Christie, partly adopting the Wernerian system, has classed the rocks of the South Mahratta Country under five heads, viz.:

- 1st. Granite.
- 2nd. Transition Rocks.
- 3rd. Old Red Sandstone.
- 4th. Secondary Trap.
- 5th. Alluvial.

Under the head of Transition he has included the gneiss and talc schist of Dammul, Nurgoond and Gairsuppa. The chlorite and clay slates, silicious schists and quartzite of Darwar, Kittore, and in short, the schists of the whole of the central and southern parts of the Darwar districts, together with the limestone of Kulladghi and Bagulcotta.

Some clay slates associated with these limestones he has classed among the grauwacke group, and the sandstone with the old red sandstone.

This classification has been apparently grounded on mineral resemblance of the schists to the transition rocks of Werner, their in general highly inclined strata, and on the circumstance of the sandstone resting, in some localities, on the schists in unconformable, and almost horizontal stratification. These facts, without the additional evidence of organic remains, and in the total absence of any associated stratum the age of which has been distinctly ascertained, would hardly be deemed by geologists of the present day, sufficiently conclusive to warrant the rocks of the S. Mahratta country being referred to the same epochs as the transition, grauwacke and old red sandstone rocks of Europe, as now defined.

Werner, in his improvement of the system of Lehman who divided rocks into three classes, viz. :

1st. Primitive : comprising plutonic or granitic rocks, and the hypogene or metamorphic schists formed with the world, and containing no fragments of other rocks ;

2nd. Secondary : including the aqueous and fossiliferous strata which resulted from the partial debris of the primitive rocks by a general revolution ;

3rd. Alluvial : comprehending the debris of local floods and of the Deluge of Noah—

intercalated a 4th class between the 1st and 2nd class, and under this head he placed a series of strata, which he thought formed a passage between Lehman's primitive and secondary rocks, hence called transition, assimilating on the one hand to the crystalline structure of mica, and clay slates, and on the other, evincing traces of a mechanical origin, and organic remains. These beds were chiefly of clay slate arenaceous rock, coralline and shelly limestone, and grauwacke, a grey argillaceous sandstone, often schistose, imbedding small fragments of quartz, flinty slate, or basanite, and clay slate, cemented together

by argillaceous matter. Werner, in the confined space that fell under his observation, found both the primitive and transition schists highly inclined, while the newer aqueous or secondary beds were horizontal; hence his too hasty generalizations. It is now ascertained that secondary strata and green tertiary beds are often found in nearly vertical position, and that some granites are newer than the lias and chalk; on the other hand, gneiss is often seen in horizontal beds, and Mr. Murchison has lately discovered in Russia the older stratified rocks extending in horizontal unbroken masses for the distance of nearly one thousand miles. The value of mineral character unsupported by others, is of small value as a test of the relative ages of stratified rocks; we see lacustrine strata of the Eocene period identical in all their mineral characters with the secondary new-red sandstone and its associated marls, and certain arenaceous beds in the cretaceous formations of the Alps, and even in some tertiary deposits, which can hardly be petrologically distinguished from the rocks of the grauwacke group.

Although it is quite possible that future discoveries may prove the sandstone to be equivalent to the old red, and many of the rocks, classed as transition, really to belong to that period? yet I consider it preferable, for the present, to arrange the rocks of the S. Mahratta country agreeably to the acknowledged geological evidence they themselves exhibit, in addition to that of a mineral character, viz: superposition, imbedded fragments of older rocks, intrusion with or without alteration, conformable or non-conformable stratification, and this with little reference to European formations. The classification will therefore, for the most part, be that of relative age. Not a single organic remain, I may observe, has hitherto been discovered in the most recent deposit in the S. Mahratta country to assist us to any conclusion, except recent terrestrial and fresh-water shells in the newer kunker.

The stratified rocks will be classed in the ascending order, commencing with the hypogene, or lowest series. The plutonic and trappean rocks will succeed.

Age of Hypogene Rocks. The hypogene schists are evidently the lowest in the group of normal rocks, and have suffered the greatest disturbance as already observed. The lowest member in this series is usually gneiss, and the highest either marble or clay slate: but there are many exceptions to this remark.

Age of Limestone. Christie has classed with the hypogene schists under transition, the limestones of Kulladghi and Bagulcotta; but from extensive observation of this rock, here and in other parts of India, I am inclined to think it, with its associated slates and shales, of more recent origin, principally from its resting on the gneiss, &c. in usually unconformable stratification, often dipping but a few degrees over large tracts, and its more intimate association with the sandstone which caps it; these rocks being usually seen together. The limestone is inclined near Kulladghi at an angle of 25° , but this disturbance is confined to areas of small extent, speedily recovering its usual little inclined position. In some localities, as near Ryelcherro and Juldroogum in the Ceded Districts, it is seen to alternate with the sandstone. Traces of coal have been discovered in a limestone in the Hyderabad country, which appears identical with the Kurnool and Kulladghi limestones.

Sandstone. The sandstone, though sometimes alternating, and often in conformable strata, with the limestone, is on the whole less disturbed, as just observed; and generally appears in almost horizontal strata, particularly in the hills south of the Malpurba. On the north bank of this river the sandstone beds have suffered more disturbance, and Christie observed them dipping at an angle of 40° to the N. W. at Chick Nurgoond, resting on vertical hypogene schists, (talc slate). In the N. E. portion of the district the sandstone of the Sitadonga hills rests on vertical chlorite and silicious schists, with a dip towards the N. E. varying from 5° to 28° . In the N. W. portion, near Gokauk, the stratification is obscure, the beds appearing as thick and nearly horizontal tabular masses. Where the strata are horizontal, the hills which they compose run in long, low, flat-topped, wall-like ridges terminating like trap elevations rather abruptly, and their sides often presenting mural precipices. These ranges usually run in corresponding elevations, averaging about 200 feet from the surface of the plain. The maximum thickness of the deposit perhaps does not exceed 400 feet.

From their being sometimes in unconformable stratification with the limestone, and imbedding fragments of its cherts, it might be inferred that an interval of plutonic disturbance took place between the periods of their deposition; though we have not as yet sufficient evidence to refer them to two distinct geological epochs. Basanite,

quartz, hornblende, actynolite, and other of the hardest fragments of the hypogene and granitic rocks are occasionally seen in the sandstone, but rarely pieces of gneiss or of the granite mass itself,—a circumstance indicating great trituration of its components prior to consolidation. With regard to mineral character, the limestones and sandstones of the S. Mahratta country resemble those of the Devonian groupe perhaps more than any other, but it has been already remarked what little reliance is to be placed on this test of the age when unsupported by other evidence; more particularly as organic remains have been discovered in the sandstones of Hyderabad and Nagpore, supposed to be identical with those of the S. Mahratta country, which would indicate a more recent era. These fossils are a hollow compressed body, of a deep black colour and compact structure, the centre of which is filled with sandstone, and supposed to be a vegetable by Mr. Malcolmson, who discovered it in the sandstone hill of Won. The others from the sandstone in the vicinity of Nagpore were discovered by Lieutenant Munro, H. M. 36th, and are impressions of plants which resemble the *Glossopteris Danœoides* of the Burdwan coal field, as figured by Royle. With these plants impressions were found, which Mr. Malcolmson conceives to be not unlike those of the large bony scales of the sauroid fish of the carboniferous and old red sandstone rocks, especially those of the latter. Mr. Malcolmson showed me these specimens at Bombay, and I agree with him that these last impressions were too imperfect to justify any opinion as to their real nature. As he justly remarks, in a subject so new, and I may add as likely to afford so important a key to the classification of the rocks of India with those of Europe, no indication should be overlooked. The occurrence of a *Glossopteris* in strata imbedding organic remains of the Devonian groupe, would be novel and interesting.

I am not aware that the diamond, a marked mineral characteristic of the sandstones of the Ceded Districts occurs in the Eastern Ghauts from the Pennaur to north of the Kistnah, and which as far as a peculiar mineral characteristic can perhaps identify rocks, identifies it with the diamond sandstones of Nagpore, in which the fossils alluded to as discovered by Mr. Munro occur, and those of Punnah in Bundlecund, has hitherto been discovered in the sandstone of the S. Mahratta country. A bed of anthracite three feet broad and 200 feet long, has

lately been discovered in the sandstone of the Goond country, and traces of it exist in the sandstone N. W. of Nagpore.

Laterite. Next in order of superposition to the sandstone comes the overlying trap; but adopting the arrangement of Lyell, I shall place it and the granitic rocks apart from those that have a confessedly bedded structure.

Laterite was classed both by Voysey and Christie with the overlying trap; by the former as a volcanic rock. Christie has not given an opinion as to its origin. It has been thought of volcanic origin, principally from its apparently unstratified and non-fossiliferous character, and being frequently associated with trap rocks. It however occasionally possesses a distinctly stratified and conglomerate character, and passes into a loose coarse sandstone, as at Pondicherry, imbedding silicified wood, and at Beypoor, on the Malabar Coast it passes into a loose sandstone imbedding layers of lignite. General Cullen was the first to discover lignite and carbonized seeds in the laterite of Quilon and Travancore. He now writes me, that he has discovered extensive beds of lignite in the laterite formation of these provinces.

Some geologists suppose it is the result of the weathering still in progress of granitic and trap rocks *in situ*. The fact of its imbedding rolled fragments of sandstone when resting on granite, and the beds of lignite and silicified wood it contains, militate strongly against this theory: and independently of these facts, nothing is more common in lateritic tracts than to see a hill of trap or of hornblende, gneiss or other hypogene schists capped with a thick bed of laterite, while the adjacent hill, composed of an exactly similar rock, and equally exposed to the action of the weather, is quite bare of laterite. I have examined beds of laterite resting on trap and amygdaloid imbedding calcedonies and jasper, but have not hitherto detected in the former any fragments of these tough silicious minerals, which are found to resist successfully even the attrition of the most rapid streams of India, long after the imbedding trap has disappeared and been lost in alluvial sands, and carried across the Peninsula into the bed of the ocean.

Their occurrence, however, particularly at the point of contact, would not prove that the laterite was formed from the upper portions of the subjacent trap weathered *in situ*. A detrital and mechanical origin like that of the sandstone, would carry into it the harder un-

weathered nodules of the rocks from which it was derived. I have also seen laterite resting on limestone without a traceable particle of lime in its composition. This could not have been limestone weathered in situ.

The fact of one hill being capped with laterite, and its neighbour being left bare, is a circumstance also militating against another theory adopted by some Indian geologists, viz. that of its alluvial origin from causes now existing. It is impossible to see the laterite capping in tabular strata, as at Beder, hills of trappean or hypogene rocks separated by vallies, wide plains or elevations, in which nothing but the latter rocks are seen, without coming to the conclusion that the beds of laterite were once continuous over these spaces, and stripped off by waters of which nothing but the trace of denudation now remains. Natural sections often remind one forcibly of that striking instance of denudation of the red sandstone, on the N. W. coast of Ross-shire given by McCulloch in his *Western Isles*, Vol. II. p. 93, pl. 31, fig. 4.

The annexed diagram is a section taken on the W. coast, between Honawer and Sedashegur.

The rarely fossiliferous character of this iron clay or ferruginous clay, as it has been called, which has puzzled some geologists, and inclined others to the theory of its volcanic origin, may be in some measure attributed to its highly ferriferous nature, often approaching that of an ore of iron. It is a fact, and, as Lyell observes, (*Geol.* Vol. II. p. 102,) one not yet accounted for, that scarcely any fossil remains are preserved in stratified rocks in which this oxide of iron (derived from the disintegration of hornblende or mica) abounds; and when we find fossils in the new or old red sandstone in England, it is in the grey and usually calcareous beds that they occur.

I have often observed, particularly in the W. Ghauts, and on the Malabar and Concan coasts, where the rains fall heaviest, that the granitic, hypogene and trappean rocks containing most iron, weather into ferruginous and coloured clays that sometimes, lithologically speaking, resemble laterite, and these when that rock is near, cause the appearance of their passing into it. I have also observed beds of considerable magnitude of an impure oxide of iron in gneiss and hornblende, sometimes cellular and pisiform (and from which much of the iron in laterite has doubtless been derived); but when we look up from the microscopic view afforded by these slowly weathering blocks of rock and beds of ore in situ,



*Section shewing denudation of
Laterite between Honauer and
Sedas hughur. Captain Newbold*



and cast our eyes upon even the present extent of laterite over the surface of Southern India, the thickness of its beds (at Beder 200 feet,) its flat-topped ranges of hills, the great gaps effected in their continuity evidently by aqueous causes no longer in action, its often elevated position above the drainage of the country, its imbedding layers of lignite from silicified wood, and occasionally water-worn pebbles of distant rocks, we find we can no more attribute its origin to the weathering of rocks *in situ*, or to their present transported detritus, than that of the old sandstones of Europe to the sandy disintegration now in progress of accumulating by rains around the bases of older sandstone, granite, and hypogene rocks, although a mineral resemblance exists as in the case of the true and pseudo-laterites.

Having said thus much to warrant my placing laterite among the rocks of aqueous and mechanical origin, I shall proceed to notice it as it occurs in the South Mahratta country. It may be remarked, *passim*, that fossil shells have been scarcely ever found in the tertiary Rhenish brown coal beds, though in the vicinity of Bonn large blocks have been met with of a white opaque chert, containing numerous casts of fresh-water shells, which appear to belong to *Planorbis rotundatus* and *Limnea longiscata*.* The laterite capping the overlying trap of the South Mahratta country does not appear to have been invaded or altered by it like the brown coal beds. But similar blocks of chert containing fresh-water shells, viz. two species of *Cypris*, three of *Unio*, and many individuals referable to the genera *Paludina*, *Physa* and *Limnea*, and also *Gyrogonites*, have been discovered by Mr. Malcolmson and myself entangled in it.

Near Kulladghi, where it reposes on the limestone, it exhibits undoubted signs of horizontal stratification. It is never seen altered by the granite or trap. West of Kulladghi, near Ooperhutti, beds of a gritty sandstone loosely agglutinated, resembling that into which the laterite passes near Beypoor on the Malabar Coast, rest in a similarly horizontal and unaltered position on the overlying trap; fragments of which occur in this superimposed sandstone.

Kunker, Gravel, and Regur. That singular deposit, for so I consider the Regur, is superimposed on all the rocks that I have just de-

* Lyell, Elements, Vol. II, pp. 281-282.

scribed. There is frequently an intervening bed of gravel or of the older kunker, in which the remains of a mastodon have been discovered, near Hingoli, Nizam's country. I have not met with gravel beds in the South Mahratta country. The diamond is found in the gravel beds below the Regur in the Cuddapah district. My ideas regarding the origin of those deposits have been elsewhere stated.

Age of the Plutonic and Trappean Rocks.—Granite. From the rarity of sections, it is difficult to ascertain the relative age of the granite by the tests usually resorted to by geologists in fixing the ages of plutonic rock, viz.:

- 1st. Intrusion and alteration.
- 2nd. Included fragments.
- 3rd. Relative position.
- 4th. Mineral character.

Christie evidently views the granite of the South Mahratta country as primitive, according to the Wernerian theory; but states that there is a granite at Gairsuppa, in Canara, "not so old as the common granite of India," which, from mineral character and association with the gneiss and other hypogene rocks, he classes with them, in the transition series of this school. But within the last half century it has been ascertained that this granite, considered formerly as the oldest of rocks, sometimes belongs even to the tertiary period, and its presence at Gairsuppa, and in the southern portions of the South Mahratta country, intruding into, disturbing and altering as it does, these crystalline schists, plainly proves its posterior origin.

But there is no proof adduced of any other granite of India being anterior to the granite of Gairsuppa, and there is every reason to believe that the granite of Gairsuppa and the Western Ghauts must rank among the oldest granites of India, until the age of the rocks they have altered and intruded into be satisfactorily proved to be posterior to the other hypogene rocks that prevail so extensively over its surface.

There is, moreover, a granite more modern than the common granite of the Western Ghauts, Gairsuppa, and indeed of India, which is seen to penetrate the latter in veins and dykes, a fact proving its posterior origin,—and which, although it has not hitherto been discovered

in the state of dykes in the sandstone and limestone, has converted the former into quartz rock, and the shales of the latter into jasper and chert, indicating a posterior or contemporaneous origin.

The disturbance and metamorphic effects produced by the eruption of this granite do not appear to extend to any great distance from the foci of plutonic disturbance. The sandstone ranges in the S. Mahratta country are usually little inclined, particularly in the ranges S. of the Malpurba, resting unconformably on the hypogene schists and granite, in highly inclined stratification; but travelling a short distance north we find them showing more signs of plutonic disturbance, and, according to Christie, the sandstone of Chick Nurgoond is uplifted at an angle of 40° resting on the vertical hypogene schists; a fact indicating two eras of plutonic disturbance.

It is a striking fact that no fragments of undoubted granite or gneiss have been noticed in the pebbles of these sandstone conglomerates, which consist chiefly of quartz, chert, jasper, basalt, flinty slate, and the hard portions of the chloritic and actynolitic schists, the two last rocks bearing a small per centage in relation to the rest, and those of quartz greatly predominating in the lower beds. The inference is, either that the attrition which converted the wreck of the pre-existing rocks into sand and gravel was so great, as to grind down their mass beyond the possibility of recognition, leaving nothing but fragments of their hardest nodules and veins, or that the oldest granite was still undenuded, and with the gneiss at this era was as yet but partially uplifted and retained its natural subordinate position.

It is certain however from the included pebbles of the flinty slate, jasper, actynolited and chloritic schists, that the plutonic action of granite had commenced prior to the origin of the sandstone, and had metamorphosed or crystallized the hypogene, or rather formed schists of the wreck of which the sandstone is formed.

If this reasoning be admitted, it is obvious that at least two epochs of great plutonic activity have taken place. The first anterior to the formation of the limestone and sandstone, by which the hypogene schists were rendered crystalline and partially subverted. The second, posterior; and marked by another granitic eruption, which burst up through fissures in the old granite, altering the limestone and sand-

stone. From the latter occasionally resting on the former in less disturbed strata it may be inferred, that the limestone suffered some degree of dislocation before the sandstone was deposited. There is little doubt from the unaltered and highly inclined stratification of some of the beds resting on the granite, that it must have been protruded by this second upheaval in a solid form. Other highly inclined beds are altered, which indicates a heated but solid state of the intruding rocks.

The third movement or series of movements by which perhaps a great part of S. India was slowly and gently lifted up to its present elevation, raising beds of laterite in a horizontal position to the height of 7,000 feet and upwards, appears to have taken place during the tertiary period. This great *soulevement* is perhaps rather attributable to volcanic than plutonic action, since the granites of both eras appear to have been raised in a solid form, and no granite of India has yet been observed altering or intruding into tertiary rock. Possibly its phenomena were connected with those attending and following the grandest eruption of trap in the whole world, the overlying trap of Western and Central India, which evidently took place in the tertiary period.

During these epochs, it is almost needless to say, that the surface must have undergone various oscillations at different periods, during which the aqueous strata were deposited, consolidated, and partially denuded, uplifted and submerged.

Age of Basaltic greenstone. Like the granite the basaltic greenstone is evidently of two eruptive epochs, as we see dykes of it crossed by more recent dykes.

The greenstone of the first epoch is posterior to the older granite and hypogene rocks which it penetrates, and with which it has been uplifted in a solid form; partaking of all their dislocations and abrupt truncations. This older greenstone stops short of the sandstone; the conglomerates of the latter imbed pebbles of the greenstone.

The newer basaltic greenstone penetrates, and alters the limestone and sandstone, but stops short of the laterite. Both rocks are distinguished mineralogically from the tertiary or overlying traps by their rarely assuming an amygdaloidal character, and their freedom from agates, opals, calcedonies, zeolites, green earth, olivine, &c., so abundant in the latter.

Age of the overlying Trap. It overlies and penetrates the sandstone and newer basaltic greenstone, and from its altering and disturbing the fresh-water limestones of Nirmul, and its superior position to all the rocks of the S. Mahratta country except the laterite, kunker, and regur, is referred to the tertiary epoch. It is strikingly mineralogically distinguished from the older trap rocks, as just explained.

The order of superposition of the rocks of the S. Mahratta country in descending order appears to be as follows:—

Regur,	}	1st group.
Old kunker,		
Laterite,		
Lateritic sandstone,		
Overlying trap,		
Basaltic greenstone,	}	2nd group.
Granite,		
Sandstone,		
Basaltic greenstone,	}	3rd group.
Granite,		
Hypogene schists,		

Comparison of these groups with classified European groups. There can be little doubt of the rocks of the 1st group belonging to the tertiary period, after what has been remarked regarding the age of the overlying trap on which they are superimposed. The remains of the Mastodon have been found, with other fossils pointing to the Pleiocene division of the tertiary epoch, in the gravel and kunker below the regur, near Hingoli, in the Nizam's territories. No fossils have been yet found in the regur; but its position, extent, thickness, and the impossibility of accounting for it by causes now existing, warrant me perhaps in referring it to an epoch anterior to the post-Pleiocene or historic period.

2nd Group. No sufficient data for fixing exactly the age of these rocks. The presence of coal and other mineral and fossil indications point to the Devonian or carboniferous groups.

3rd Group. The clue to the approximate age of these rocks will be found in properly fixing those of the second; a point of great impor-

tance in the geology of India, and to which I would fain call the attention and endeavours of all geological observers to fix, by searching for fossils, &c. If the rocks of the second group belong to the Devonian series, the hypogene schists must be either the rocks of the Silurian or Cambrian series, as their unconformable stratification points out a greater age than the less disturbed and superimposed beds of limestone and sandstone. We need not even despair of finding fossils in gneiss, chlorite, and mica slates of India, since that illustrious geologist Elie de Beaumont displayed to the wondering eyes of the Savans of Europe the instructive fact of belemnites, (a fossil of the chalk period,) in chlorite schist.

An Account of the early Ghiljáees. By Major R. LEECH, C. B., late Political Agent, Torán Ghiljáees at Kálát-i-Ghiljáee. From the Political Secretariat of the Government of India.

[The character of part of this paper is somewhat of a lighter order than usually appears in our pages : but our readers will at once understand the motives which have led us most readily to avail ourselves of it, almost as written. The traditions of the Ghilzaees recorded by Major Leech, give a valuable insight into the manners and habits, the social condition and the ordinary train of thoughts, of a race of men very little known. The acute observation of the writer of the memoir has let no point escape him which may illustrate the real character of the curious tribe whom he describes ; and the student in ethnography will, we are convinced, be thankful for the exposition of social peculiarities thus afforded to him.—EDS.]

The following account has been compiled from notes taken partly when Political Agent at Candahar in 1839-40, and partly while in political superintendence of the expedition under Colonel Chambers against the Toran Ghiljaees in 1841, and while Political Agent at Kálát-i-Ghiljáee in 1841-42, (during the siege,) and partly from a written

account drawn up at my request by Mulla Pairo Lodeen, who staid with me throughout the siege.

The Ghiljaees, as will be shewn, are only Afghans by the mother's side, being by the father's descended from the Sultans of Ghor.

The word is properly Ghalzo'e : from *ghal*, thief ; and *zo'e*, son—meaning the son of theft, the fruit of a clandestine amour. The Ghiljaees themselves give this derivation of the word, although they would appear to be ashamed of it by turning Ghalzo'e into Ghiljaee. The Persians have out of compliment turned it for them into Ghilzye.

On the 28th August 1841, while making a tour through the, till then, unvisited Ghiljaee tribes of the Arghandah valley, a Rokhee Mulla of some reputed sanctity and respect in the tribes, said they were all Ghiljaees, as the Persians pronounced the word Ghiljyes as the Afghans and themselves did, from being descended from Ghilj the son of king Bet.

In my journal kept during the siege, I find the following memorandum, dated 22nd April 1842.

“May not the word Ghilzye be derived from غلیچ Ghalech. (The Persian vowel mark *zer* having in Afghanee the pronunciation of *a* in hare); and Ghalech being often written for قلیچ Kilech : and the tribe may have been called Ghalechees, or descendants of Ghalech. An acquaintance, a great grandson of Ashraf-khan, is named Ghalech-khan.”

A mistake has very generally been committed by supposing the termination *zye* or *zai* to the names of Afghan tribes to be derived from the Persian word for to be born. The word is a corruption of the Pushtoo *zo'e* a son, and a true Afghan of the *sarah* or country would tell you he was a Popalzo'e or Babakanzo'e as the case might be ; a Popalite or Babakanite ; and he would not say he was a Popalzye or Babakanzye, on pain of being abused as a *spai zaman* (*comes filius*) Parseeban.

It is related that the Caliph Abdul Malik, son of Marwan, despatched his commander-in-chief Hujaj, son of Yoosaf, a Sakufee by tribe, to subdue Ghoristan. It was then under two princes, Shah Jalaladeen and Shah Muazzadeen, sons of Sultan Bahram who had the country given him in grant by Alee, the cousin of Mahammad, on a visit he paid

the Hazrat at Medina. The great grandfather of Sultan Bahram was Soosee, alias Mahammad Sam Ghoree, who first introduced Islamism into Hindustan. It was he that built the fort of Sealkot, and that killed Raja Pathoora.

The Sultans of Ghor were descended from Zohauk, nephew of Ibas, son of Esam, son of Sam, son of Noah, who expelled Jamsheed from Persia.

Shah Husein, the son of Shah Muazzadeen, emigrated on the invasion to the country of Shaikh Batanee, between Cabool and Candahar, by whom he was received into his family. Batanee had a daughter, with whom the tradition runs; Shaikh Husein formed a connection, unknown to the parents, until their daughter's appearance betrayed her.

The Ghiljâees still preserve this time-honored custom, judging from several cases that came under my notice, the most prominent of which occurred at Kalat-i-Ghilzye. A young unmarried lady of the aristocratic Shah Alam Khel branch of Rokhee Ghiljâee, was safely delivered of a son and heir, the father of which, her intended, was no less than a holy Sayad of Pishing, then absent in India. It appears that they were engaged, and at liberty therefore to have their Namzat-bazee; but as the Sayad had not paid up the whole of the marriage settlement by some 100 rupees, the parents would not allow him to take her home. He therefore resorted to this Ghiljâee mode of cheapening his bargain. I met him afterwards in India, but did not enquire whether his lady was yet with her parents or with his own.

It is very probable that the Afghans, if they were really Israelites, should have been posted by their Cabtu Bukhtanasar on the confines of his dominions towards India. We find Sultan Shahabudeen bringing down the Afghans from Ghor and posting them on the borders of India, and this system of colonizing an unquiet border with convicts seems to have been much in vogue. Thus we find the tribe of Hazarahs far from their present country, posted in the plains of the Punjab below Cashmeer. A colony of Persians was planted in Cabool, and one of Ghiljâees in Balkh. And between the Ghiljâees and Duranees on the Candahar road, we find ten solitary houses of Hazarahs, so called by the Afghans, at Asya Hazarah; no doubt a larger colony was once posted there to keep the peace between those two rival tribes.

I find from my journal, that on the 28th September 1844, I sent for their chief men to gain information. They informed me they were originally Uzbecks from Turkistan, and are by tribe Sadlechees. They have the water of the canal called Bokanah. They furnished six men and one officer to the Duranees, and were enrolled among the Baneezais.

But to return to the lovers. On Shaikh Batanee and his wife discovering the state of their daughter's affections and person, they became most anxious to have the couple married; but family pride was in the way, and they were anxious first to know concerning the *syal* or rank in society of their guest. He was therefore questioned, and gave himself out as a prince born, and invited them to ascertain the fact by despatching some one to Ghor, his native country. This was done, and a confirmation of Husein's affirmation attained in time, it is to be hoped, to allow the babe to enter without shame into the world. Husein is said also to have married the messenger's daughter, in consideration of his taking the trouble of going all the way to Ghor; others say, that on his return he refused to confirm Husein's assertion until he had promised to marry his daughter also. This is probable, and according to the character of an Afghan Cossid, getting a promise made before imparting good news.

* * * * *

The Ghiljaees say, that Sultan Mahmood of Ghuznee first brought them down from the Koki-kase or Koki-roh, and they began to dig Karez, (vide the Karez of the Sulemanees near Ghuznee). Malcolm (I think) says they were nearly exterminated by that monarch, as a punishment for a party of them having plundered his baggage, and that they only regained strength in the time of Timoor.

The first person of note known to the present inhabitants was Sultan Malakhe, a Tokhee.

It is probable that Mahammad the progenitor of the Mahammad-zye Tokhees, and Isaac the progenitor of the Isak-zye Hotakees were both

* *Note.*—We have to apologise for omitting a brief, and apparently carefully compiled list of the genealogies of the Ghilzye families. It would be of interest were circumstances such as to place any of our readers in immediate communication with this tribe; but, as it is, we may be perhaps excused omitting it.—Eds.

men of note in their day, from these tribes being considered the aristocratic ones.

I saw a Rakam of Aurangzeb, dated the 9th of Jamadee'l-awal, 1022 A. H., appointing Malik Malakhe to the charge of the high road from Kalat to Karatoo, (the former is in the Tamak valley, and the latter in the Arghandah,) to protect it from Hazarah robbers. Aurangzeb no doubt found Malakhe the most powerful of the Ghilzye chiefs at enmity with the Hazarahs; as patronizing an officer of his own creation at court, he no doubt found very different from supporting a newly created chief over his tribe.

The Hotakees I suppose from being removed from the high road were not required by Aurangzeb, and therefore remained unnoticed; that monarch's sole object being to secure his communication with Ghuznee, Cabool and Hindustan, and not coveting revenue from their Karazees, and almond orchards.

The Hazarahs are said to have been driven out of the Arghandah valley in four days.* Malakhe is said on this short campaign to have received valuable co-operation from the Khan-khel chief Mane, whose descendant I find from my journal visited me on the 13th August 1841.

Khuram says he is the son of Taj Mahammad, the son of Avqhan, the son of Khajah, the son of Mane, the son of Taoos, the son of Daroo, the son of Habeeb, the son of Khan, the son of Parwat, the son of Barak by his wife Khatah, the son of Mahammad, the son of Yoonus, the son of Rahmand, the son of Tokh, the son of Baroo, the son of Tolad, the son of Ghiljye. I have mentioned the descendants of Malakhe in a former part of this account.

At the time that Malakhe was chief of the whole Toran tribe, (both Hotakees and Tokhees,) Jabbar it is said was chief of the Ibrahim Ghiljyes.

The Peer-khanah, or spiritual fatherhood of Malakhe were the So-deen (Ala-udeen properly) Sayads.

Malakhe had a daughter, by name Nazo; who was one day playing below Kalat-i-Ghiljye with girls of her own age, on the banks of the

* This might have been effected by Aurangzeb's troops, had they known of the existence of the Passes discovered by me in 1841. That from Kalat-i-Ghiljæe to Surkh Sang (No. 1, Appendix,) and the other from Chasmah-i-Moosaka, viâ Cheeno into Karatoo, (No. 3, Appendix.)

river Tarnak, when a Fakeer, appearing to be from Hindustan, approached the party, and said, "What good girl among you will give me a kiss?" Some ran away, others hid their faces, and some abused him; but Nazo, throwing back her veil, and approaching, said, "Oh Fakeer, a kiss of my face is at your service."

The Fakeer, to the surprise of all, instead of availing himself of the offer, stroked her head with a fatherly hand, and said, "I have prayed to God to give you three or four children; one of whom shall be a king, (Hajee Meer-khan, alias Meer Wais)."

The father of Meer Wais (a Sodeen is the informant,) was in the employ of Malakhe, whose daughter Nazo falling in love with him, (true daughter of Ghalzo'e,) an elopement to the Ataghar hills, occupied by the Hotaks, was the result; who, however, for fear of Malakhe's wrath, refused them refuge; and they had to spend their honey-moon in the desert hills, living principally on game.

Getting tired of this, Nazo proposed to her husband that they should go "Nanawat" (as supplicants) to her father, who was of a forgiving disposition.

Having no other resource this plan was adopted, and with success. Malakhe received them kindly, as well as some Hotakees who accompanied them. When giving them leave, Malakhe asked his daughter what she would have, a chadar or veil; it being the Afghan custom that the first time a daughter visits her father after her marriage, he gives her a veil. She replied, "The Hotaks have no land (on the Tarnak river), kindly give me a piece of land."

Malakhe gave her a piece of land below the Tabaksar hill, opposite to Kalat, watered by and dependent on the Ajurghak canal; and to the groom who led the horse she rode, he gave the land dependent on the spring of the Jukhtaran hill close by. This Jillodar was a Kishyanee by tribe. Others say, that Nazo got ten days and nights water right on the canal, and her groom two. These shares are now (1841) distinct.

Malakhe was killed in battle at Darwazye, between Inzargai and Surkh Sang, and was buried at Ab-i-Yazee.

The father of Meer Wais is called by the Hotaks Shah Alam. The Tokhees contradict them, and say they only were called Shah Alakhels after their progenitor married a Shah Alam Tokhee's daughter.

This is absurd; for by the Tokhee's own shewing, Shah Alam was the son of Alee Malakhe's brother, so that Nazo was not a Shah Alam-khel.

Jabbar, the Ibrahim chief, was killed at Yayas in battle with the Safees, and buried on the road between Cabool and Jalalabad. The place where his tomb is situated is famous for cold, wolves, and thieves, on which account some Persian traveller has cursed the tomb. In the course of time, Nazo gave birth to Hajee Meer-khan, alias Meer Wais, the same who liberated his country from the Persian rule, and his countrymen from the tyranny of Shahnawaz-khan, the Georgian governor of Candahar.

The reasons for Meer Wais visiting Persia are found in Malcolm's Persia, and more in detail in the Chronicles of a Traveller. The Ghiljyes believe that while at Mecca he demanded a sign from heaven, that he should free his country from a foreign yoke. It was given him. On awaking, his sword was found lying bare at some distance from the scabbard in which he had secured it before going to sleep.

It was Shahnawaz's penchant for wine and women, that lost the country for the Persians be it remembered, and he was a Faringee.

Beyond the village of Chahil Dukhtaran on the road to Chahil Zeena, there is a slippery rock called Ang-i-Sakhshak, down which the children of Candahar on Fridays and other holidays slide. This was one of the scenes of Shahnawaz's debaucheries.

The place at which he met his well-merited death was at Bela-i-Sultan Khudadad in Argasthan—he was following or despatching 300 horse across the Band-i-gil,* on the road to Maroof, to collect revenue from the Kakars. He was not thought worthy to be killed by the hand of a man; so Murado, a Babee eunuch and jester, was ordered to kill him in full durbar the day after his seizure. The following Pushtoo Badala is still extant:

“ Sháhnawáza bujul báza,
Da Murado da lás parotiya kuna wáza.”

* I find from a memorandum in my journal in November 1839, that the road from Candahar to Deh-i-Ambar was occupied by Popalzais, and that I proposed to make the following arrangements for the protection of the road beyond Deh-i-Ambar, viz:—On the Candahar side of the Tagak Pass near some wells, a small fort to be built and eight horsemen to be stationed; on the other side of the Tagak Pass, at a place called Hou-

Shahnawaz the bujul-baz, (player with the knuckles of legs of mut-ton, *i. e.* a light fellow of low habits.)

By the hand of Murado (there) you lie exposed.

Shah Ashraf was, the Ghiljæes say, killed by his cousin Shah Husen of Candahar, (*i. e.* by his orders,) on his arrival at Koh-i-Mundak. Some deny that Ashraf murdered Mahmood, believing that he died mad.

The wars of Mahmood, and his cousin and successor Ashraf in Persia, are detailed in the Chronicles of a Traveller. The following two anecdotes are still told strangers visiting Candahar, connected with the invasions of Persia : one is, that many of the Ghiljæes who accompanied Mahmood on his expedition to Persia were mounted on bullocks, with their ragged kosaks or felt cloaks on, and their sheep's skin of flour strapped to their backs, and an old iron hatchet or a sword in a broken scabbard their only arms, just as if they were going to the water-mill at the bottom of their native village to bring home flour. This will be easily believed by officers who have been in Afghanistan, and have seen after an engagement bodies of men with nothing but sticks in their hands. When the city of Ispahan was taken, it is said that Shah Mahmood gave his followers leave to take possession of the house that each might enter, with every thing in it, even the widow of its owner who fell fighting, for his home. That one of the handsomest palaces of Ispahan thus fell to the lot of such a "Ghool-i-Biyaban" as I have above described ; who entered it in his above full dress, leading his bullock after him into a splendid saloon covered with rich carpets, at the end of which was seated the lady of the mansion surrounded by her damsels ; and backwards and forwards over the carpets these two animals walked, the one looking for some thing to which he could tie his fellow.

The lady of the mansion ordered her handmaids to do all they could to please the visitor ; to take his bullock into the stable, and divest him of his boots of sandals and tattered woollen cloak, and take him to the bath.

This they had some difficulty in doing, as he would not consent at first that his bullock, sandals or cloak should be taken out of his sight, they being his only ones ; and each article was surrendered after a little dakai, a fort and six horsemen ; on the Candahar side of the Gill Pass at a water-mill, a fort and eight horsemen ; on the other side of ditto, six horsemen ; at Jaknaree and Shamai, a fort and eight horsemen. The whole under Abdul Lateef-khan, Barikzai, of Maroof.

struggle, accompanied with Pushtoo abuse ; the handmaids setting his mind at ease in Persian, of which he did not understand a word, and by signs. He was finally taken to the bath, and never had the attendant barbers operated on such a subject before, the cracks in his huge feet and hands being like ravines of his native hills. After cleansing him as much as possible, and shaving his hedge hog-looking head of hair, he was attired in trousers and shirt of red twilled cotton, the richest under garments a *man* must wear, and other suitable parts of dress ; and conducted back into the saloon, where a rich entertainment was laid out, at which the lady of the mansion presided.

The Afghan finding himself more at home, determined to make the most of his good fortune, and act the part of the master of the house.

Observing that the trousers of the lady were of gold stuff, while his were of common red, he insisted on an exchange ; and in them went he next morning, proud of his appearance, to Mahmood's *darbar*, where his appearance putting his illustrious tribesmen to shame, he got nothing but a sound beating.

The second anecdote was told me on the scene of its occurrence, the Achakzai hills, on the 23rd May 1838, while ascending the Kojak Pass. An Achakzai who had accompanied Shah Mahmood on his expedition to Persia, had married a rich lady of Ispahan. In the midst of the rich repasts she provided for him, and the beautiful garden of a hundred fountains and thousand parterres that he found himself master of, he would sigh (between a grunt, a groan and a growl,) " Oh ! for my country of the thousand-holed cakes, and alas ! for its Makhai gardens."

The lady, fancying rightly that the country that could surpass the capital of Persia in its luxuries, must be heaven itself, determined to return with her new husband to Afghanistan. Whatever might have been her misgivings on the road, seeing that as they advanced the fertility of the country decreased, her despair was at its height on arriving at *home*—a *khel* or encampment of *ghijdee*, (black hair tent) in one of the wildest parts of the Achakzai hills. But her heart broke when she found that the thousand-holed bread was made of the vetch called *gál*, which becomes honey-combed in baking (food that her slaves would reject in Persia,) and that the Makhai gardens were nothing

but the stony hills covered with the thorn, known by that name in Pushtoo.

It was such uncivilized acts as the above, no doubt, that made the Persians stigmatize the Afghans with the following :

Oughán i khar, Tobra ba sar ;
Bákalee ba khar, Dingla ba zan :

Which the Afghans retort in the clumsy "Tuguogee" of Parseeban,

Da khira kurbán.

Leaving the period of the Ghiljye (not Afghan) wars in Persia to the above-mentioned authorities, I return to the seat of the tribes.

On Hajee Meer-khan (who seems to have set the fashion of performing the Haj to Mecca, as we find many Hajeess among the chiefs both Afghans and Ghiljyes about his time,) gaining possession of Candahar, he called on the Tokhees to pay him revenue for their lands, and furnish him with recruits for his wars, as they had not assisted him in the late struggle. In reply, they asked how they could be expected to give up rights that they had acquired with so much trouble, and after so many battles.

The chiefs of the Tokhees at this time were Shah Alam, the son of Alee, the brother of Malakhe, and the son of Shah Alam, Khushalkhan, and they would not acknowledge the supremacy of the Hotakees ; war therefore broke out between the tribes, and the Tokhees were obliged at last to quit the Tarnak valley and take refuge, that is, to retire to the Arghandah.* Others formed into two Toraks or gatherings. The Shah Husen-khel, and other tribes about Ab-i-Tazee had their gathering at Yakhav, and the Peerak-khels and other tribes around them had their gathering at Omakai-kalat, at this time was held by the Tokhees under Hajee Edil, the son of Malakhe, to whom are attributed some supernatural powers.

He had a son called Bayai, a very brave and daring man ; who built a small fort on the river Tarnak, a little way from Kalat up the road ; and the Hotakees had a fort on the other side of the river at Jukhtaran, the Hotak gathering being at Choudai.

* I found in 1841, that a threat to burn the crops they had left standing, and to fill in their karez (irrigation tunnels,) brought them back to the Tarnak, (month of July.)

Although Bayai had 100 men in his fort, he always went out alone on his expeditions, which were directed against the opposite Hotak fort. It was his habit at dawn to attack the people of the fort as soon as they came out, and he sometimes brought three and four heads, and no one dared to meet him hand to hand; at last the drinking-water of the Hotaks became bitter, (i. e. they were hard prest) and they laid in ambush for him one morning; and, hamstringing his horse first, succeeded in killing him. On the death of Bayai, Kalat was taken possession of by the Hotaks, and now Mahammad-khan, alias Hajee Angoo, the son of Yaya, and nephew of Meer Wais, became governor.

About this time the report of Nadir Shah's marching on Candahar reached the country, and the Hotakees assembled and came to the decision that they had a new and powerful enemy in front, (Nadir Shah) and an old one in their rear (the Tokhees,) and that it was prudent to get rid of the enemy in the rear, and then meet the enemy in front; therefore they collected their whole tribe, besides procuring 4,000 horse from Candahar and from Puli Sangee, made a sudden attack on the Peerak-khel Tarakut Umakai, which might be said to be empty, as the chiefs Ashraf-khan and Allaiyar-khan, sons of Khushal, were absent on the Arghandah to collect troops. The whole Torak was massacred, women with child not being spared. On Ashraf-khan and Allaiyar-khan hearing of this disaster, they took the most solemn oath an Afghan can, viz., *Zan-talak*, that they would not spend a night at home before they had revenged themselves on the Hotakees. *Zan-talak* is divorcement of a wife.

Proceeding viâ Mezan and Teereen, they joined Nadir Shah's camp at Cheenaran, and tendered their allegiance. That monarch appointed Allaiyar-khan his deputy at Ispahan, and was led by Ashraf-khan to Candahar, (Herat being taken after a siege,) which place it is said held out for fourteen months. The heroic defence of the burj or tower of Mulla Alee, a Ghiljye, after the fall of Candahar, deserves to be recorded. The ruins of it are incredibly small in extent.

When Nadir was besieging Candahar, Abdul Ghafoor was governor of Kalat-i-Ghiljye; he with Abdul Rasool, were sons of Hajee Angoo, by a Peerak-khel Tokhee mother. Abdul Rusool had gone to Sarobai of the Kharotees, to collect the Ghiljyes of that neighbourhood to raise the siege of Candahar. Nadir heard of it, and made a Chapao on the levies at

Shibar, of whom he made a great slaughter. Here Jan Tarakee came in ; Nadir then returned to Candahar, leaving 4,000 men to besiege Kalat ; when it fell, Jan Tarakee was left in command.

Moosa-khan, father of Maddut-khan Isakzai Duranee, (surnamed Dongee) conducted the Chapao on Shibar. The grave of Jan Tarakee is on the top of Kalat, over the spring close to that of the Fakeer. He had such power over the tribe as to have left the proverb behind him of

“ Wak da Khudá dai da Ján Tarakee.”

“ It rests with (or depends on) God ;” and Jan Tarakee, one of the present Tarakee chiefs, Arzhegee, (1st July 1841,) is the son of Ala Verdee, the son of Suleman, the son of Jan, the son of Meer-khan, the son of Kasam, the son of Doulat, the son of Madoo, the son of Peroz, the son of Nassoo, the son of Mummye, the son of Ahmed, the son of Tarak.

Nadir Shah conferred on Ashraf-khan the chiefship of all the Ghurghushtees, and avenged him on the Hotaks by leading away captive 1,500 of their families to Hindustan, Turkistan and Persia.

During the first part of the reign of Ahmed Shah, Ashraf-khan was governor of both Kalat and Ghuznee, and he accompanied the Shah on his first campaign to Hindustan. On his return the Duranee chiefs persuaded the Shah, that Ashraf-khan was far too powerful for a subject. He with his son Haleem-khan were therefore invited to Candahar and thrown into prison, and their seals were made use of to entice Allaiyar from Ispahan, the Shah proposing to share his conquests with him.

Allaiyar-khan on his arrival was also thrown into prison, and nothing is known how these three met their fate ; the wall of their prison by some is said to have fallen on them.

Although the above belongs to the history of Ahmed Shah, I mention it, as of course his historian would neglect to do so.

I met in the Ghiljye country, which I had failed to do at Candahar, traces of Zamroot Shah of Candahar, on the 23rd August 1841. At Dab-i-Pighai, not far from the shrine of Taroo Nika, on the brink of the hill, the remains of a small fort are pointed out. Here it is said that Zamroot Shah banished a mistress, by name Lolee, to employ herself in agriculture and gardening, and that in her ignorance she planted parched wheat. A more beautiful view than from this position on a fine

day cannot be imagined. Near the above-mentioned shrine is a spring, which it is said cannot be fathomed. Its water is efficaciously used in cases of Sujah-Sulfa (black cough) in children, which either lasts two months or forty days, from which no child is exempt.

I have mentioned before, that the Khaleels and Momands held the country before the Hazarahs. I remember one day on the Arghandah asking a Tokhee chief, what a stone and mud pillar on a neighbouring eminence was for? It was built, said he, long before our time; it is some boundary mark of the Khaleels and Momands. In my journal under date 22nd January 1842, I find the following memorandum:

Shekh Mate-khaleel had (the Khalak people say) four sons and one daughter; Shah-i-Mardan, Kalat, Garmam, Hasan, and a daughter Jukhtaran, who all on being buried sent forth springs of water from their respective graves of the same quality, which retains its temperature during winter, (it may then be seen running smoking down the hill.) The graves are all in the neighbourhood;—Jukhtaran, a small mound east of Kalat, just across the Tarnak Hasan-i-Mate, above the village of Khalak; Garmam, (they deny the word being Garmah) west of Kalat; and Shah-i-Mardan, south of Kalat, a small flat-topped hill like the one over Khalak called Tabaksar. They say that Shah-i-Mardan outlived his brothers and sister, and boasted that as they had made streams of water, he on his death would make a river. On account of this vanity and presumption, the stream from his grave is the smallest of all, only supplying drinking water.

In Dara's translation of Nyamatullah's history of the Afghans, Part II, page 19, Chapter XX., Shekh Mati-khaleel is mentioned as chief of twelve Sarbanni clans. Hasan-i-Mate lived, we may suppose, in the time of Zeerak, the great grandson of Abdul, and in the time of Nahmand the great grandson of Ghiljye, and the fort of Kalat was of course never fortified before the spring on the top of the hill burst out; and it may be assumed, that it was first fortified by some royal hand, as the surrounding tribes would never have allowed one branch to occupy such a commanding position.

I never succeeded in satisfactorily ascertaining whether Shah-i-Safa or Kalat was the oldest. The former is said to have got its name from some sick monarch, who then experienced "Shafa" (recovery) from his disease. I have heard it called by some the capital of the country once

called Bakhtar; and by others, that of Zameen-i-Khawar, who is said to have been a brother of Dawar, (Zamundawar). I have no doubt Aurangzeb fortified Kalat-i-Ghiljye for Sultan Malakhe, and Shah-i-Safa for Sultan Khudakye, if he found them dilapidated. Sher-khan, we find from the account of the early Abdalees, brother of Sultan Khudakye, commanded at Shah-i-Safa on the part of the king of Delhi.

I had almost forgot to mention, that the Moosa-khel Tokhees are divided into Buran-khels, Nazar-khels and Khwaidad-khels; and that the latter are divided into Shakee-khels and Mamee-khels.

Although the account of the early Ghilzyes ought to end here, I cannot forego giving an abstract translation of Mulla Pairo's whole account.

Mahammad Ameen-khan, the son of Ashruf, and Rahmatullah-khan the son of Allaiyar, on hearing of the fate of their fathers fled to the Suleman-khel country to Zarmut and Kalawaz. Azam-khan, the son of Ashruf, and some other children were led captive from Kalat to Zameen-dawar. From this place effecting their escape, they fled to the Persian court, and from it received the countries of Khukees and Nermasher. Ahmed Shah conferred the chiefship of the Tokhees and Kalat on Soorkai-khan Babakarzai, who was shortly after murdered by the Mahammad-zai Takhees.

Soorkai-khan had two sons, Sayud Rahmat-khan and Lashkaree-khan; the former accompanied the Shah on his campaigns, and the latter was stationed at Kalat.

On the 26th August 1841, I saw a descendant of his, Khaleel-khan, son of Rahmat, son of Hajee Munsoor, son of Usman Ghanee, (called Surkai Sultan by Nadir, and Khoja-khan by Ahmed Shah), son of Joga, son of Meer Hazar, son of Taooz, son of Kasum, son of Utman, son of Suleman, son of Babakar, son of Shamal, son of Yoonus, son of Rahmand, son of Tokh, son of Baroo, son of Tolad, son of Ghiljye.

Sometime after the accession of Timoor Shah, Mahammad Ameer-khan was invited from the Suleman-khel by that monarch, and made chief of Kalat and of the Tokhees and Hazarahs; and on Timoor Shah marching from Candahar to Cabool, Mahammad Ameen (Amo) Khan paid his respects with 100 Suleman-khel swars at Pali Sangee, and received a dress of honor, and other marks of the royal favor: at the same

time Noorulla-khan, son of Hajee Angoo, was created chief of the Hota-kees, with the flattering title of Ikhlas Kulee-khan, and the revenue of the countries of Dera Ismail-khan, Daman, Banoo and Urgoon. He was on his death succeeded by his son, Abdu Raheem-khan.

On Azad-khan declaring independence in Cashmeer, Amo-khan was at Herat, from which place the Shah sent for him and despatched him with Sardar Maddut-khan Duranee at the head of a force to that province. In the battle that was fought with Azad-khan, Amo-khan was shot by some one of his own party at the back of the head, the ball coming out at one of his eyes: his corps was brought to Kalat to be buried. He left three sons, Nealee Nyamat-khan, Futteh-khan and Meer Alam-khan.

On the accession of Zaman Shah, Walee Mahammad-khan (with the title of Walee Nyamat-khan) succeeded his father, being very young, and Moladad-khan Moosa-khel was his naib, or deputy.

On Shahabudeen-khan, the son of Ramatullah-khan, coming into notice, a feud broke out in the tribe of Tokhees. The rise of Shahabudeen is thus accounted for. The Ameen-ul-mulk was by tribe a Babee, and having once in darbar spoken rather sharply to Walee Nyamat-khan, the latter foolishly allowed himself to retort with an old Pushtoo proverb. From that day Shahabudeen was taken by the hand, the Ameen-ul-mulk supplying him from his own private funds. The tribe arranged themselves in two parties, and Kalat was sometimes in the possession of one, and sometimes in that of the other. In one of the many skirmishes that took place, Moladad-khan, the Tokhee deputy was killed.

On one occasion some horses of Shah Zaman's coming with a caravan from Cabool, were plundered by some Tokhee robbers of the clan of Koortah-khel. Immediately on hearing of it, Walee Nyamat-khan with a few of his Yassawals pursued them. The robbers took to the hills, and Walee Nyamat-khan was killed by them while storming them. His corpse was conveyed to Kalat, and buried with his father's.

Fatteh-khan soon after avenged his brother's death, by decapitating several of the robbers, and making the rest take refuge in India; he hung up the heads below Kalat.

Shahabudeen-khan and Fatteh-khan were engaged in their quarrels until the war between the Ghilzyes and Duranees broke out, which occurred in the following manner.

Shah Mahmood from Candahar had made one march beyond Kalat, and Shah Zaman from Cabool had arrived at Aghojan; his chief Sardar Ahmed-khan Noorzye being with the advanced guard one stage ahead, (at Tazu) his defection from which place to Mahmood Shah caused the overthrow of Zaman Shah's power.

This *pad-shah gardush*, or revolution among the Duranees, occurring in the heart of the Ghilzýe country, suggested to that tribe the present as a favourable opportunity to declare their independence, and make an attempt to establish a Ghilzýe kingdom.

Abdu Raheem-khan Hotakee was declared king, and Shahabudeen his Vazeer; his hearty co-operation being secured by the former giving him his daughter Sahab Jan, (with whom when in her father's house he had been in love,) the wife of the defeated Shah Zaman, and mother of the princes Nasar, Kaisar and Mansoor, with all her jewels, and handsome carpets, and numerous cooking utensils. Shahabudeen-khan was left to stop communication on the high roads, and Abdu Raheem-khan went towards Cabool to raise the Suleman-khel. Troops were detached from Cabool, and the Ghilzýes were defeated; the Ibrahim Ghilzýes losing 5 or 6,000 men. Abdu Raheem-khan retired on Kalat; and a Duranee force having marched from Candahar, the Ghilzýes left their strong position on the hill to meet them, (Fatteh-khan had already gone over to the Duranees). The battle was fought between Jaldak and Umakai on the ridge called in Persian "Tappah-i-Surkh," and in Pushtoo "Sirah Ghah." The Ghilzýes were defeated; the Tokhees losing 7 or 800 men. The Hotakees being chiefly horsemen, escaped comparatively unscathed. Winter put an end to further hostilities. This year 1802 A. D., is still remembered by the Ghilzýes as the Sal-i-Katul, or year of massacre. The chiefs on the Ghilzýe side were Abdu Raheem-khan Hotakee and Shahabudeen-khan Tokhee; those on the Duranee side were Abdul Majud-khan Barik-zai, Saidal-khan Alako-zai, Azam-khan Popal-zai, Shadee-khan Achak-zai, (Arzbegee) and Samandar-khan Bame-zai.

In the ensuing spring Ahmed-khan Noorzye marched with a force from Cabool. On his arrival at Hulan Rabak, the Jalal-zai Tokhees under Mulla Zafran, a grandson of Malakhi, opposed him; but were defeated with a loss of 600 men. Ahmed-khan continued his march to Candahar, and brought out a large Duranee force with guns and shaheens. This time the Tokhees under Shahabudeen-khan and Fatteh-khan, kept to

the hill of Kalat, out of which very strong position every attempt of the Duranees to dislodge them failed, with loss of men.

The Duranees failing at Kalat, determined to carry away the Ghiljye families which had been left for security on the Arghandah; and they boasted of this intention, calling to the Ghiljyes on the hill to ask Dara-khan if he had any message to send by them to his women and children. After the Duranees had started for the Arghandah, Dara-khan taking his swars by a short road arrived at the Tarak or encampment, in time enough, during the night to throw up a sangar or entrenchment of loose stones.

The Duranee detachment arrived in the morning, and were thrice repulsed from the sangar; but being disciplined troops, they were not easily to be defeated. At this time some of the occupants of the sangar who were not fighting for their honor (wives,) left the sangar and fled. The Duranees under cover of their laden ponies and mules, made another attack, which proved successful, and eight members of one family were cut down on the one carpet on which they were sitting. The Duranees lost 100 men.

This was the last battle between the Duranees, Tokhees and Hota-kees. After this Abdu Raheem-khan and Shahabudeen-khan retired to the Mammye hills. Shahzadah Shuja-ul-Mulk had also taken refuge in the Kaker country, where he organized a powerful faction, which Shahabudeen-khan and Fatteh-khan Babakar-zai joined, as did Shakar-ulla-khan, the son of Abdu Raheem-khan Hotakee. On Shuja-ul-Mulk becoming Shah, Fatteh-khan and Shakarulla-khan attended on him; but Shahabudeen-khan never did as long as he lived, for which the Shah never forgave him; and hearing of his having built a fort in Nawak, Gulistan-khan Achak-zai, governor of Peshawar, was despatched to destroy it; Fatteh-khan Babakar-zai accompanying him. On entering the district of Nawak, so secure was the Achak-zai chief that Shahabudeen-khan would shut himself up in his fort, that he accepted Fatteh-khan's invitation to dinner at his place, Jameeyat.

Shahabudeen-khan getting intelligence of this, sallied out with his cavalry and fell upon the Duranees as they were carelessly straggling on to their stage, and routed the cavalry, killed the artillery men, burnt the gun carriages, and spiked the guns, which remained there all the winter. Next spring Sohbat-khan Popal-zai, being detached from Cabool

with a force, recovered and mounted the guns, and made use of them for several days without effect against the fort walls, which remained entire until destroyed by British Sappers in the autumn of 1839.

Shahabudeen-khan and Fatteh-khan for a long time were played off against each other by the tribe, and the enmity existing between them was considerably increased by Shahabudeen-khan's brother Meer Mahammad (whose praises as a bold soldier are still sung,) being killed by Fatteh-khan, in the district of Khakah. This enmity continued unabated until the death of Fatteh-khan, and the two rival chiefs had generally two or three fights every season, (harvest.) On the death of Fatteh-khan, Shahabudeen-khan made the usual mourning visit to his son, (the present) Samad-khan, and this long-standing quarrel was then made up.

Samad-khan married a daughter of his, giving a daughter in return to his grandson, Mansoor-khan.

This brings the Toran Ghiljye history down to a tolerable modern period, and nothing remains to be noticed, but a few particulars regarding the forces furnished to the Duranee kings by the Ghiljyes.

The Andadees furnished 600 horse as did the Tarakees in the following proportion.

Babadeen-khels 120, Sak-khels 120, Peroz-khels 60, Tsoil-khels 60, Gurbuz-khels 120, and Na-khels 120.

The Hotakees furnished 500 as did the Shamal-zais, including the Babakar-zais 500, and the Tokhees furnished 1,000.

The Tokhees received 1,60,000 Tabreeze rupees (10 annas each) per annum thus :—

1064 Swars at 100,	..	..	..	..	1,06,400
Mausabdars, (officers,)	..	..	..	..	35,600
Hakim, (chief,)	..	..	..	..	18,000
					<hr/>
					1,60,000

The distribution of the Tokhees, as follows :

	Ashoor-khan says,		Meerza Pairo says,	
Kishyanees,
Bata-khel,
Jalal-zai,
Pero-zai,

	Ashoor-khan says,				Meerza Pairo says,			
Baso-khel,	33	..	..	33	..	..	33
Aiyooob-zai,	23	..	..	23	..	..	23
Meeran-zai,	104	..	..	104	..	..	104
Noor-khel,	81	..	..	81	..	..	81
Mahammad-zai,	330	..	..	330	..	..	330
Aka-zai,	31	..	..	31	..	..	31
	1,006				998			

The distribution of the Mahammad-zais is as follows :

Peerak-khel,	16	Shah Husen-khel, ..	16
Kalloo-khel,	17	Umur-khel,	5
Isse-zai,	18	Seekak,	18
Fakeer-zai,	15	Hasan-khel,	5
Babree,	7	Adam-zai,	?
Burhan-khel,	?	Hotak-zai,	30
Pato-zai,	70	Akrabe-zai,	9
Moosa-zai,	50	Moosa-khel,	16
Karmoo-khel,	12	Sae-e-zai,	3
Buhlol-zai,	9	Bazik-zai,	3
Nato-zai,	4	Khan-khel,	18
Peerwalee-khel,	9		

The Jalal-zai horsemen were thus divided :

Peroz-khel,	25	Nano-khel,	18
Bahram-khel,	43	Siya-zai,	28
Dawut-khel,	15	Bahlol-khel,	44
Najo-khel,	9		

The Pero-zai horsemen were thus divided :

Sayud-khel,	57	Irakee,	31
Asho-zai,	24	Sure-zai,	29

The Meeran-zais say that in the time of Sayud Rahmat-khan they furnished 133 men in the following proportion :

Nuhradeen,	14	Sen-khel,	39
Akhe-zai,	30	Moghal-zai,	28
Uhwa-zai and Kute-zai, ..	22		

The distribution of the Hotakees was as follows :

Malee-zai, 24	Maroof-zai, 11
Khade-zai, 9	Utman-khel, 12
Tadzak, 12	Isak-zai, 70
Barat-zai, 16	Aka-zai, 16
Ramee-zai, 70	Baee-zai, 25
Umar-zai, 12	Baba-zai, 6
Toon-zai, 34	Saghad-zai, 32
Tahiree, 7	Alee-zai, 6
Saut-khel, 16	Polad, 3
Eesaf-khel, 16	Tahiree, 6
Issozai, 1	

Again the distribution of the Isak-zai Hotakee's 69 men is as follows :

Kutte-zai, 14	Hade-zai, 25
Kudeen-zai, 7	Umar-zai, 7
Kundle-zai, 14	Mandeen-khel, 2

The Sursat, or provisions for the royal army in its march through the Ghiljye country was thus collected :

Kala-i-Ghiljye, 4-5 Hotaks, 0-5 Tokhees.

Sar-i-Asp, Babakar-zais.

Tazee, Mahammad-zais, Moosaka, Pero-zais and Jalal-zais.

Nothing now remains but to note the locations of the different tribes.

The Tokhees are to be found in the Arghandah valley, the Tarnak valley, the Khakak valley and in Nawak.

The Hotakees are, generally speaking, found in Marghah, and in the Syorye, (shady side) and Peetao, (sunny side) of the Bare-ghar and Surkh-koh hills, and more particularly speaking, the Isak-zais are found in Marghak and Ataghar.

The Malee-zais in Girdezangal and Gha Bolan.

The Barat-zais in Roghanai.

The Aka-zais in Kharnai and Dumandia.

The Tun-zais in Syorye.

The Umarzais at Mandav.

The Sagharees (Saghadais) at Mandah.

The Ramee-zais at Ataghar, and the Baee-zais at Sorah and Kingar.

The Surkh-koh is called in Pushtoo Sirah-ghar.

The Babakar-zais are found at Swad-zai, Jungeer, Sar-i-As (asp.) Shah Mardan and Nawah.

The Shamal-zais are found at Shibar, Halatagh, Jetz and Mundan.

Other information of a geographical and minute statistical nature regarding the Toran Ghiljyes is in my possession, as are the original Daftars which could not be generally interesting. The following one fact may be.

The scarped hill and barrack walls against which the Ghiljyes ran their heads, on the 21st May 1842, losing 400 killed, were their own handy work chiefly, (the garrison having merely finished them,) of the preceding autumn.

It being impossible to procure labourers from Candahar, I had occasion to call on the tribes to furnish labourers in the exact proportion they had formerly furnished soldiers to the Duranee kings, and they were mustered every morning by their respective chiefs, *rod* in hand. Being highly paid, (one rupee to every three,) they continued to work long after the winter set in, sleeping in the plain below the hill in open *graves*! two feet deep for warmth. Her gracious Majesty's head on the new Company's Rupees made a few demur taking them at first; but finding out their value they soon got over this prejudice against "the image;" and after spitting on the rupees and treading on them, took the "Buttars" as they called them home as lawful gain, without a self-accusation, it is to be hoped, of their having encouraged idolatry.

That money was little valued by the Afghans of the wilds (Sahra) before the British forces entered Afghanistan, the following will prove.

On my way from Cabool to Candahar in the winter of 1837-38, I several times failed in getting milk and butter, while my attendants who had travelled before in the country were plentifully supplied. I found the reason to be that I offered money, while they gave needles, and odds and ends of coarse Cabool chintz.

On one occasion after marching all day, I lost my way and got benighted, and separated from my baggage. On arriving at one of these Ghiljaee-khels or wild encampments, they allowed me to enter their tents, but nothing would induce them to kill a sheep for money, (they even refused to take a gold ducat,) insisting on having cloth; and the sheep was finally purchased by one of my attendants giving an old Ca-

bool choghak. On leaving Candahar for Quetta, I laid in a stock of needles, little looking-glasses, pewter rings and wooden combs; and again on leaving Kalat-i-Naseer for Shikarpoor, I was obliged to lay in a stock of pieces of coarse native white cotton cloth. For a whole piece I used to get a sheep; and eggs, fowls, milk, butter, &c. were only purchasable by the yard of cloth. In the autumn of 1841, even in the Ghiljaee country, melons were sold for equal weight of wheat, and grapes for three times their weight in wheat.

On the army first arriving at Candahar, the wild hill Afghans who got paid for the supplies they sold in Company's rupees, took them to the town shroffs, and paid one and two annas batta to get them changed for the "Kalamah-dar" or Candaharee rupee, thus giving eighteen annas for eleven or twelve; not being able to count, they talked of having a "kid-skin" of rupees.

List of Places on a portion (upper) of the Arghandah River.

<i>Left bank.</i>	<i>Right bank.</i>	<i>Left bank.</i>	<i>Right bank.</i>
	Arghasoo.	Parsang,	Mamachakh.
	Takhoon.	Sangeesar,	Surkhakai.
	Salem.	Tarkhuloon,	Chaghbad.
Meezan,	Shekhan.	Barakee,	Nangyan.
	د Dolanna.	Saigaz,	
	۳ Shadee.	Kailatoo,	Narrai.
	۳ Totee.	Jijgah,	Sardarrah.
	د Dohlah.	Bargah,	Biland warkh.
	د Kondilan.	Girdai,	Ulachee.
	د Jadang.	Shukushta,	Shaigan.
	د Jakhtoo.	Nalee,	Thakr.
	Chalakoore.	Kadalak,	Sapitao.
	Maidan.	Pumbazar,	Duberak.
Takhoonak,	Surkhsang.	Tanghutai,	Pezgul.
Taj Mahammad,	Molai.	Karulghan,	Chaghmagh.
Walagai,			Oman, <i>or</i>
Madat,	Bagh.		Jirghanai.
Mossai,			Kaftalak.
Gazah,	Beetab.	Kharnai,	Solan.
	Gumbat.		Bareezar.

The Arghandah river rises in Malistan, then comes to Fort Alee Gouhar, then to the Fort of Bakar Sultan, called Sangi Mashak, west bank; thence Turgan, west bank; thence Gazah, west bank; thence Bal hasarr, west bank; thence Mughaitoo, west bank, (near Kharnai.)

The Attah Hazarabs (uppermost) join into the Kalandar Hazarabs (who are next below them on the river) at Kharnai. The boundary of the latter and the Peroz-khel Tokhees is at Avkol, the boundary of the latter and the Bahlol-khel is at Fort Husen, the boundary of the latter and the Perozais is at Aldai (Nulla Zardad,) the boundary of the latter and the Khan-khel is at Beetab.

Route from Kalat-i-Ghilzye to

Dera Ismail-khan, Kalat-i-Ghiljaee, Urgakoo, Dab-i-Pishai, crossing the Pass; Fort Konah in Marghah, Fort Maiyar in Halatagh, Wuch Marghah, (or Kaimkhelee,) Darwaze, beyond Jetz; Sargadee, Ismail-khan, Kanokee, Gul Wanah, Kurman-i-Sar, Ashewat, Kashkalwee, Handeerah Kalan-i-Kakeree, Chukhah, Jyob, Shagee, Sarmaghah, passing Gholaree Pass; Neelye, Tormyumah (Gomal,) Kats-speenkee, Manjigarah in Daman, Kulachee, Gada-i-Gandipoora, Dera Ismail-khan, Sakaree, Jetz, Yaiyak-beree, Shaheedan, Turwoh, Kasakuk, Dakha (deserts,) Taraghaz, Dochnah, Lakatijah, Goostoe, Se-nika, Tsatsandai, Doo-mandee (Ghuznee road falls in here,) Kotkee, Kanזור, Sarmaghah.

The Nasarees (Daoot-khel) having bullocks, first move to Hindustan by the Gholaree or Zawah Pass; then the other Nasarees, then the Kharotees, then the Myan-khels.

Proceedings of the Asiatic Society of Bengal, MAY, 1845.

The monthly meeting of the Society was held on Tuesday evening, the 13th May.

Charles Huffnagle, Esq. senior member of the Committee of Papers, in the chair.

At the commencement of the meeting Mr. Houston, C. S. begged to bring to notice what appeared to him to be an error in the proceedings for October, in relation to the picture voted to Mr. Bird. A conversation of some length arose out of this without the result of a vote. It was proposed by Captain Shortrede, and seconded by Captain Marshall,

“That no report of the Proceedings of the Society at its meetings be published till it has been verified by the next subsequent meeting,”—which was carried unanimously.

New Members Proposed.

Lieutenant Sherwill, 66th N. I., Behar Revenue Survey, —proposed by E. C. Ravenshaw, Esq. C. S. seconded by W. H. Quinton, Esq.

Dr. Henry, —proposed by E. Blyth, Esq. seconded by S. G. F. Heatly, Esq.

The following list of books presented, exchanged and purchased was read:—

Books received for the Meeting of the Asiatic Society, Tuesday, 13th March, 1845.

BOOKS PRESENTED.

1. Meteorological Register for February and March, 1845.—From the Surveyor General's Office.
2. The Oriental Christian Spectator, Nos. 3 and 4, of March and April of 1845.—By the Editor.
3. The Calcutta Christian Observer, of May, 1845.—By the Editors.
4. The Journal of the Royal Asiatic Society, No. XV. Part 2, 1844.
5. Notes on Indian Agriculture.—By A. Gibson, Esq.
6. On the Geographical Limits, History, and Chronology of the Chera Kingdom of Ancient India.—By J. Dowson, pamphlet, 2 copies.
7. Proceedings of the Zoological Society for 1843, Part II, two copies, and Proceedings from January to March, 1844, one copy.—By the Society.

8. Reports of the Council and Auditors of the Zoological Society of London, 1844, two copies.—By the Society.

9. Transactions of the Zoological Society of London, Vol. 3, Parts 2 and 3, London, 1843.

10. Magnetic Reports of the Observatory at Bombay, May to December, 1843.—By Government.

11. Magnetic Observations for 1842 and 1843, by G. Buist.—Presented by ditto.

12. Report on the Meteorological Observations made at Colaba, Bombay, from the 1st September to 31st December, 1842, by G. Buist.—Presented by ditto.

13. Meteorological Observations for 1843, by G. Buist.—Presented by ditto.

14. Tracings of the Wind-Gauge for 1842, 1843, by G. Buist.—Presented by ditto.

15. Barometrical Observations, by G. Buist.—Presented by ditto.

16. Verhandelingen van het Bataviaasch genootschap van Kunsten en Wetenschap. Vols. 18, 19, 1842, 1843.—By the Society.

17. Natur en Geneeskundig archief voor Neerland's indie—Eerste Jaargang Batavia. 1844.—By ditto.

18. Catalogus Plantarum in Horto Botanico Bogoriensi cultarum alter auctore, J. C. Hasskarl, Bataviae, 1844.

Books Exchanged.

19. The Annals and Magazine of Natural History, Nos. 96 and 97, Vol. 15, February and March, 1845.

20. The Edinburgh New Philosophical Journal by Jameson, No. 74, July to October, 1844.

21. The London, Edinburgh, and Dublin Philosophical Magazine, third series, Vol. 25, Nos. 166, 167, 168, 169, of October, November and December, 1844.

22. Journal Asiatique, Quatrième Série, Nos. 16 and 17, Juillet et Août 1844.

23. The Athenæum, Nos. 900 to 907.

Books Purchased.

24. Introductory Lectures on Modern History, delivered in 1841, by T. Arnold, second edition, London, 1843.

25. Theogony of the Hindoos, by Count M. Bjornstjerna, London, 1844.

26. Political Philosophy, by H. Brougham, London, 1843 and 1844, 3 vols.

27. System of Logic, by J. S. Mill, London, 1843, 2 vols.

28. Journal des Savans, Septembre and Octobre, 1844.

Read the following letters, from Messrs. Allen and Co. the Society's London Agents, and W. W. Bird, Esq. :—

TO HENRY TORRENS, Esq. *Secretary to the Asiatic Society, Calcutta.*

SIR,—We have been requested by W. W. Bird, Esq. to forward you the enclosed letter. We beg to acquaint you that the map referred to by Mr. Bird was forwarded on the 26th February last by the ship Princess Royal from Liverpool, and will be handed over to the Asiatic Society by our agents as soon as it reaches Calcutta.

W. H. ALLEN and Co.

London, March 19, 1845.

TO HENRY TORRENS Esq. *Secretary to the Asiatic Society, Calcutta.*

SIR,—With reference to the intimation made by me to the Meeting held on the 5th of July, 1843, I have directed to be transmitted to you the newly constructed Map of

India by Messrs. W. H. Allen and Co. from surveys executed under the orders of the Hon'ble East India Company, which Map is the most complete at present procurable, and to request that you will have the goodness to present it to the Society on my behalf.

I have the honor to be, Sir,
Your obedt. Servant,

W. W. BIRD.

London, February 18, 1845.

Read the following letter from Mr. H. B. König at Bonn :—

To H. PIDDINGTON, Esq. *Sub-Secretary of the Asiatic Society, Bengal.*

SIR,—I have the honour to inform you that I have duly received, through the agents of the Asiatic Society, Messrs. Allen and Co., the books directed to me, and offer now my best thanks for this valuable communication.

Messrs. Allen and Co. will direct to you the following of my publications :

- 6 Script, Arabum
- 12 Radices Ling. Pracritiana
- 12 Panini, eight books
- 3 Malawica, Agnimitre
- 12 Radices Ling. Sanscrita
- 12 Meghaduta
- 12 Sacuntala
- 3 Lassen's Zeitschrift, part IV. V. VI. 16
- 6 Lassen's Indien I. 1.

I hope the Society may accept these works as a sign of my highest respect. As Sanscrit Literature is much cultivated in Germany, and many works published in India are not to be procured, even in London, I should be particularly obliged, if the Society would have the goodness, to cause about 10 or 15 copies of *all* works, formerly or lately published in India, to be forwarded to me, for immediate prompt payment, or instruct its agents to let the works be delivered to me at the prices fixed by the Society.

H. B. KÖNIG.

Bonn, 5th December, 1844.

With reference to Mr. König's request to be supplied with a number of copies of *all* the Sanscrit works published in Calcutta, the Secretary stated that Dr. Roer had prepared a list of Sanscrit works published in Calcutta, which he now presented, from which it appeared that 10 or 15 copies of each would amount to a very considerable sum. He further suggested that as a part of these works had been published by the School Book Society it was possible that body might be willing to send Mr. König their publications through the Society. He was hereupon authorized to refer to the School Book Society in the first instance, and for the details of this application to the Committee of Papers, when a scheme of returns could be finally made up and determined upon by the Society.

The Secretary in laying on the table the papers relative to Mr. Heatly's proposal for the reformation of the Statistical Committee, which had been circulated to the Committee of Papers, stated that the opinion expressed by that body was strongly in favour of the proposition, whereupon the following resolution was moved by Mr. Huffnagle, and seconded by Mr. Torrens.

“Resolved,—that the re-institution of Statistical Researches on a systematic plan by this Society appears a desirable object, and that a Committee be appointed for the purpose of considering and reporting on the specific measures through which this object may be obtained. The Committee to consist of Mr. Heatly and Mr. Alexander,”—which was carried unanimously.

Read a letter transmitted to the Secretary by order of Government from Capt. Nevile H. M. S. Serpent forwarding copies of the Logs of H. M. S. Magicienne in the hurricane of 1818 and 1819 at Port Louis, Mauritius.

The Sub-Secretary pointed out that these logs were printed both in the first and second edition of Col. Reid's work, 1838 and 1841.

Read the following letter from Government :—

No. 1289 of 1845.

FROM F. CURRIE, Esq. *Secretary to the Government of India,*

To the Secretary to the Asiatic Society of Fort William, the 2nd May, 1845.

FOREIGN DEPARTMENT.

SIR,—I am directed by the Governor General in Council, to transmit to you, for such notice as the Society may deem it to merit, the enclosed copy of a Report by Lieutenant Dalton of his visit to the hills on the banks of the Soobanshiri River.

F. CURRIE,

Fort William, the 2nd May, 1845.

Secretary to the Government of India.

Referred to the Editors of the Journal for publication.

The Secretary presented on the part of W. Seton Ker, Esq. C. S. a Note of the course of study of students in the Sanscrit language.

This interesting note was handed to the Editors of the Journals for early publication.

The Secretary reported that during his absence Dr. Sprenger, now Principal of the Delhi College, had addressed the Sub-Secretary as follows :—

“I have to ask you half a dozen other favors : I send this note to you through Messrs. Ostell and Co. who will pay you for the “*Geographie d' Abulfeda en Arabe, 2 vols.*” which is on sale at the Society for 5 rupees. You have once expressed that you would

sell duplicates of your library if so pray let me have "Asiri Bibliotheca, Arabo-Hispanica, in two volumes," of which you have two copies, you must not charge it too high.

I have written to Messrs. Ostell for De Sacy's *Grammaire Arabe*, and Hammer's *Geschichte der schonen Redekunste*, in Persian. If they should not be available at Calcutta, you would oblige me by lending me for a short time the copy of the Asiatic Society; I intend to have the *History of Persian Poetry* lithographed, and to compile an Arabic Grammar in Urdu, and want for a few days De Sacy's book.

and that officer having requested Dr. Roer to report on the application, received from him the following:—

TO H. PIDDINGTON, ESQ. *Sub-Secretary Asiatic Society.*

SIR,—With regard to Dr. Sprenger's application I have the honor to report, as follows:—

As Dr. Sprenger wants Hammer's "*Geschichte der schonen Redekunste in Persian*," and de Sacy's Arabic Grammar, for the purpose of publishing an Arabic Grammar for the use of the native students in this country, I would recommend to the Committee of Papers to assist him in his useful undertaking, and to allow him the use of those works for a limited period of two or three months. It would, however, not be advisable to accede to Dr. Sprenger's second request of selling him the duplicate copy of Asiri's "*Bibliotheca Hispano-Arabico*," a work very rare and valuable, and I take this opportunity of proposing to the Committee to establish it as a rule not to sell duplicates of valuable works, as it is of importance to keep always one copy in the library, while the other may be circulated among the members of the Society.

29th April, 1845.

E. ROEN,

Librarian.

I quite agree in, and indeed suggested this arrangement.

H. PIDDINGTON,

Sub-Secretary.

which being circulated to the Committee of Papers for their sanction, Dr. Roer's recommendation was adopted, and the books have been forwarded to him by the steamer viâ Allahabad.

Read the following letter from the Royal Bavarian Academy of Munich:—

HENRY TORRENS, ESQ., *Vice-President and Secretary of the Asiatic Society of Bengal.*

SIR,—Having been favoured, by the intervention of Dr. William Griffith, with your kind declaration dated 23rd May 1844, that you would willingly order an exchange of publications between the Asiatic Society of Bengal and the Royal Academy of Sciences at Munich, I am directed to explain to you how much the Royal Bavarian Academy is gratified by such a literary intercourse. Supposing that the Asiatic Society of Bengal does not possess the series of *Memoirs* published in earlier times by the Bavarian Academy, a complete set of them shall be sent over to the care of Messrs. W. H. Allen and Company, Leadenhall Street, London. In return we take the liberty of announcing to you, what we are wanting in our library from your most precious publications.

1. Index to the 4th vol. of the *Malabharut* complete.
2. *Ināya*, 2nd vol. 690 p. 3rd vol. 682 p. 4th vol. 937 p. in 4to.
3. *Jawāme-ool-Ilm-ul-Riāzi*, 168 p.; with 17 plates 4to.

4. Anis-ul-Musharrahin, 541 p. 4to.
5. Sharaya-ool-Islam, 631 p. 4to.
6. Tibetan Dictionary, 373 p. 4to.
7. Vocabulary of Scinde language, by Capt. Eastwick.
8. Grammar and Vocabulary of the Baloochi and Punjabee languages. Leach.
9. Harriwansa, 563 p., royal 4to.

The other books are in our possession, and also partly the most interesting Journal of the Asiatic Society of Bengal, the completion of which by your kindness, I take the liberty to ask for. There is wanting of this most precious Journal, vols. I. II. III.; From the year 1839, are wanting the months of August, September, October and November; from 1841 is wanting No. CXIII., and from No. CXVIII. all is wanting published till to the present day. We should consider as a particular favour your friendly intervention for the completion of this work.

In the box containing the newer publications of our Academy, you will also find the Almanacks of the last years, which give a general catalogue of all our publications, and of which I beg you to select any more you may believe interesting for the purpose of the Asiatic Society. Also you will find there two little books of my own: *Systema Mat. Med. Veget. Brasiliensis*, and on the Constitution, Sicknesses and Physics of the American tribes, which I beseech you to present in my name to the Asiatic Society.

Regarding the Society's wish of possessing specimens of German geology, we have treated on this matter in the physical class of our Academy, and the members concerned in similar studies have been directed to get together a convenient collection for the Technic Geological Institute of your Society. But it is understood that such a collection cannot be ready immediately. After its completion it shall be committed into the hands of your agent at London. Every communication in any branch of natural history the Asiatic Society may think convenient for us, shall be highly acceptable. I beg you to send the Society's communications either by London, where your agent may take care of them, or to Hamburg directly, where Mr. G. T. E. Roeding is the Academy's agent.

Allow me, Sir, to present you the assurance of the high consideration with which I have the honour to be,

DR. MARTIUS,

Secretary of the Math. and Phys. Class of the Roy. Academy of Sciences.

Munich, 6th of January, 1845.

The Secretary was authorized to dispatch to the Royal Bavarian Academy the books required, and to express the gratification of the Society at the opening of an intercourse with this learned body.

Read the following note from Major Wroughton pointing out a misconception as to Colonel Stacy's Hebrew MSS. (Proceedings of January).

MY DEAR SIR,—I have just received a letter from my friend Colonel Stacy, in which he mentions that the Hebrew MS. sent by me, in his name, to the Asiatic Society's Museum, has by some misapprehension been considered as a donation. I have no recollection of the exact purport of my note, which accompanied the MS. but feel confident, if you

will kindly refer to it, that "I merely sent the MS. at Colonel Stacy's desire, to be lodged in the museum of the Asiatic Society."

Ballygunge, April 16th, 1845.

ROBERT WROUGHTON.

The Secretary stated that a note had been duly appended to the MSS. for which a tin case had been made, so as to preserve it as much as possible from all chance of injury.

Read a letter with Prospectus of his work forwarded by Dr. Falconer :*—

Prospectus preparing for publication, under the auspices of Her Majesty's Government, and of the Honourable the Court of Directors of the East India Company :

A work to be entitled,

FAUNA ANTIQUA SIVALENSIS,

Being the Fossil Zoology of the Sewalik Hills, in the north of India, by HUGH FALCONER, M.D., F.R.S., F.L.S., F.G.S., Member of the Asiatic Society of Bengal, and of the Royal Asiatic Society; of the Bengal Medical Service, and late superintendent of the H. E. I. C. Botanic Garden at Saharunpoor, and PROBY T. CAUTLEY, F.G.S., Captain in the Bengal Artillery, Member of the Asiatic Society of Bengal, &c.

The object of this publication is to make known, in a connected and complete series, the numerous fossil animals which have been discovered in the North of India, by the Authors and other inquirers, during the last twelve years; and to develop the bearings of these discoveries on the physical and geological history of India during a great part of the tertiary period.

The fossil Fauna of the Sewalik range of hills, skirting the southern base of the Himalayahs, has proved more abundant in genera and species than that of any other region yet explored. As a general expression of the leading features, it may be stated, that it appears to have been composed of representative forms of all ages, from the oldest of the tertiary period down to the modern, and of all the geographical divisions of the Old Continent, grouped together into one comprehensive Fauna in India. Of the forms contained in it may be enumerated, in the *Pachydermata*, several species of Mastodon and Elephant, the Hexaprotodon Hippopotami, Merycopotamus, Rhinoceros, Anoplotherium, Sus, and three species of Equus; in the *Ruminantia*, the colossal genus Sivatherium, peculiar to India, with species of Camelus, Camelopardalis, Bos, Cervus, and Antelope; in the *Carnivora*, species of most of the great types, together with several remarkable undescribed genera; in the *Rodentia*, several species; in the *Quadrumana*, several species; in the *Reptilia*, the Gigantic Tortoise (*Colossochelys*) with species of Emys and Trionyx, and several forms of Crocodile. To these may be added the fossil remains of Birds, Fishes, Crustacea, and Mollusca.

The materials in the possession of, or accessible to, the Authors, are singularly rich and abundant. They consist of vast collections made by themselves during the last twelve

* We re-print here the prospectus which will also re-appear for some time in an abridged form on the cover of the Journal as an advertisement, and we trust that the work will find in India the support it so richly merits.—EDS.

years along several hundred miles of the Sewalik range. Of these, one portion, which comprises the contents of upwards of two hundred chests, is now deposited in the British Museum, having been presented to the national collection by Captain Cautley, and will with the consent of the Trustees, supply the chief part of the descriptive details and illustrations of the Work. Other large collections in the India House will be resorted to when requisite; and in cases where their own materials may be less complete, and they will have access to specimens from the very extensive collections made by their friends and fellow-labourers, Colonel Colvin and Captains Baker and Durand, of the Bengal Engineers, whose published researches will be incorporated in the projected publication.

In order to embrace in it as far as may be possible a general Fossil Fauna of the Continent of India during the tertiary period, illustrations will be drawn from the Irawaddi fossil discoveries of Messrs. Clift and Crawford; from the researches of Dr. Spilsbury in the valley of the Nerbudda; and from those of Dr. Lush and Lieutenant Fuljames in the Gulf of Cambay, all of which localities have yielded fossil remains like those found in the Sewalik Hills. With the same object, all the available materials relating to the osseous remains of the elevated plains of Thibet, which are so importantly connected with the geological history of the Himalayahs, will be examined by the Authors, and described or figured when necessary.

On the completion of the palæontological details, a comprehensive account will follow, embracing the general results of the fossil inquiries, together with a geological description of the Sewalik Hills, to serve as an Introductory Chapter to the work. The Authors will have the aid of some of the most eminent living Naturalists in describing such departments as they may feel themselves but imperfectly qualified to deal with, such as the Fossil Fishes, Crustacea, and Mollusca.

The Authors have been induced to undertake the work by the belief, that the scientific reputation of this country and the credit of the Indian services are concerned in bringing to light researches embracing so many new facts, and bearing so importantly on the past physical history of the vast possessions of the British Empire in India. They are not insensible to the difficulty and extent of the subject, but they hope that they are in some measure prepared for it, by previous investigations, extending through several years.

In order to secure to science the full advantage of the Sewalik fossil researches, in a suitable form of publication, Her Majesty's Government and the Honourable Court of Directors of the East India Company have been pleased to accord such an amount of aid *in limine* as will ensure the successful progress of the work. The Publishers anticipate that a corresponding measure of support will be afforded by the scientific classes in England, by the British community in the three Presidencies of India, and by scientific men abroad.

Plan of Publication.—The Work will appear in about Twelve Parts, to be published at intervals of about four months, each containing from twelve to fifteen folio Plates, or an equivalent number of a larger size, where the nature of the subject may require it. The Plates to be accompanied by royal octavo letter-press. The price of each Part will be One Guinea in Europe, and Sixteen Rupees in India.

PART I.—Containing the Mastodons and Elephants will be published on the 1st of July, 1845.

Subscribers' Names will be received by the Publishers, Messrs. Smith, Elder and Co., 65, Cornhill, London; and by Messrs. Thacker and Co., Calcutta; Forbes and Co. Bombay; and Messrs. Frank and Co., Madras.

Read the following memorandum and letters :—

Memorandum.

The Secretary has to transmit two letters from the Baron Van Hoevell, and Baron de Carnbee (the latter gentleman being now in Calcutta) touching the establishment of a correspondence between our Society and that of Batavia.

I propose being authorised to send an acknowledgment of the books received, a series, as far as available, of the Journal, and the vols. of the Researches available for distribution, with a letter of thanks, and reciprocating wish to correspond.

If Messrs. Piddington and Blyth would draw each of them a note of objects in natural science desirable for our Museum from Java, with a request that we in our turn may be instructed from Batavia in like manner, these would materially add to the value of my letter.

I have seen the Baron de Carnbee, and have come to a most satisfactory understanding as to the footing on which the Societies would correspond.

H. TORRENS,

Vice-President and Secretary, Asiatic Society.

The Curators are requested to peruse the accompanying note and letters, and to put in a brief statement of the desiderata from Batavia in their several departments, which I can send down with my letter to the Society there. I have ascertained from Baron de Carnbee that English will be a convenient language of correspondence.

The Curators may state generally what duplicates or sets of duplicates they hold ready to transmit.

The Batavian Society are rich in Volcanic specimens.

H. TORRENS.

Vice-President and Secretary, Asiatic Society.

A Monsieur H. TORRENS, Secrétaire de la Société Asiatique à Calcutta, etc.

MON CHER MONSIEUR,—Je me rappelle avec plaisir notre entrevue d'hier. L'intérêt que vous manifestiez au développement et progrès de la Société Scientifique à Batavia, causera je vous en donne l'assurance, la plus grande satisfaction à tous les membres, et moi je me félicite de pouvoir leur communiquer l'heureux résultat de mes démarches. Sir Stamford Raffles, pendant plusieurs années président de notre Société, disait dans un de ses discours : "The objects of the Asiatic Society in Calcutta are so fully explained in the discourse of Sir William Jones, that it is unnecessary to enter into any explanation of them here. The researches of that Society are not confined immediately to Western India ; they extend throughout the whole regions of Asia. The whole circle and the wide field of Asia are alike open to your observations, but it occurs to me, that the interests and objects of the Institution will be more advantageously promoted by its exertions being directed to what falls more immediately within your reach, &c."

J'espère que vous partagerez mon intime conviction qu'une correspondance régulière et continue, contribuera à servir efficacement le but de nos Sociétés réciproques.

J'ai eu l'honneur de vous faire voir quelques ouvrages récemment publiés à Batavia. Vous m'obligeriez d'accepter de ma part pour votre Société un exemplaire du : "Catalogus Plantarum in Horto Botanico Bogoejensi ; auctore J. C. Haskarl, 1844," un exemplaire du :—"Natuur und Geneeskundig Archief voor Neerlandais Indie" (Archive pour les Sciences naturelles et médicales des Indes Néerlandaises 1st Année 1844.)

Avant mon départ de Calcutta j'écrirai à Monsieur le Baron van Ijboevell (Président de notre Société) qui vous offrira d'autres publications entre autres le "Tydschrift voor

Neerlands Indie," qui existe déjà sept années, et contient plusieurs articles intéressants par rapport à la littérature Javanaise et autres branches scientifiques. A mon retour en Europe je pourrai traduire et arranger en Anglais quelques articles de ma composition traitant des Isles our de l'Archipel de la Sonde, etc. et je me trouverai heureux si après avoir été examinés, ils pourraient être placés dans le Journal de la Société Asiatique à Calcutta, Enfin, Monsieur, je vous prie d'accepter l'assurance de mon respect et considération et me signe

Votre tres humble Serviteur,

BE. G. MELVILL DE CARNBEE.

Calcutta, de 27 Mars, 1845.

A Monsieur le Secretaire de la Société Asiatique à Calcutta.

MONSIEUR,—Monsieur la Baron *Melvill de Carnbee*, officier distingué de la Marine Hollandaise, chevalier de l'ordre Royal du lion Belgique et membre correspondant de la Société des arts et sciences de Batavia, se proposant de partir en peu de jours pour Calcutta, nous profitons avec empressement de cette occasion favorable pour adresser à votre honorable Société les deux exemplaires ci-joint des 18 et 19 volumes des Transactions de notre Société, qui renferment des documens précieux pour la littérature orientale

Nous vous prions Monsieur, de vouloir honorer Monsieur le Baron *Melvill* de votre bonté, et bienveillance et de faciliter, tant que possible, les recherches scientifiques qu'il se propose de faire dans l'Inde Britannique.

Recevez Monsieur, l'assurance de notre consideration distinguée.

La Direction de la Société des Arts et Sciences de Batavia,

VAN HOEVELL.

LEFECREHAVIE.

Batavia, le 2 Janvier, 1845.

N. MYER.

The Secretary stated that he had received from the curator of the Geological and Mineralogical Departments, his note of desiderata, and forthwith handed it to M. de Carnbee, and that he held now in his hand that of the Zoological curator which would be forwarded with his reply to the Society of Batavia.

Read the following letter from the Rev. Mr. Long :—

To H. TORRENS, Esq. *Secretary, Asiatic Society.*

DEAR SIR,—When on a visit to Kishnagar last January, I was favoured with a view of several pictures belonging to the Rajah of Kishnagar, three new portraits of various members of his family, and among the rest of Rajah Krishna Chandra Roy, of whom a most interesting memoir has been published in Bengali.

The drawings are kept in a damp place and are rapidly going to decay.

As one object of the Asiatic Society is to obtain rare drawings or portraits illustrative of the history of the country, it would be a desirable object to obtain the loan of those portraits in order to have copies taken.

The East India Company lie under deep obligations to Rajah Krishna Chandra Roy, as through his friendly disposition towards the English, and his influence over various Hindu rajas; the overthrow of the tyrant Suraj ad Doulah was facilitated.

Calcutta, April 17th, 1845.

JAMES LONG.

Mr. Long not being present the Secretary was desired to make some further inquiries.

Read the following letter from W. H. Hoff, Esq., the coins and human hand being on the table.

To H. TORRENS, Esq., *Secretary, Asiatic Society.*

SIR,—I have in my possession a few articles which I will send over if you think that they will be acceptable to the Asiatic Society.

The first is one of fifteen coins found in the interior and uncultivated parts of Singapore. On having a patch of land dug up, a gentleman discovered an earthen pot containing them. I have been unable to ascertain of what metal or mixture of metals the coin is composed; but I am inclined to think that zinc and silver have been employed in its manufacture. The obverse side bears the faint traces of some unknown characters, and on the reverse side there is a rude device of a lion or some other beast.

The next is a glass vessel containing a human hand kept in pepper. It belonged to a notorious footpad or robber who was long a terror to the inhabitants of the Nicobars, and had for a considerable time escaped punishment. He used to propel poisoned arrows through a *null* or tube about a yard in length merely with his breath! He was at last shot; but it was found impracticable to extricate the *null* from his death-grasp: it was consequently sawed off on both sides. The remaining portion is still in the clutch of the large and hairy hand.

24 March, 1845.

W. H. HOFF.

The Secretary submitted, from the Sub-Secretary, a prospectus of a New Zodaical Map, to be edited by J. W. Woollgar, F. R. A. S., upon a new projection, and to a convenient scale; corresponding with the Maps of Schwink, and a little larger than those of Professor Argelander, containing about 1000 stars visible to the naked eye. The Sub-Secretary suggested that such a map (the price being also only 7s. 6d.) would be a useful addition to the Society's port-folios, and moreover that the Society might appropriately present one to the Prince of Mekhara. (See Proceedings October, 1844.) Two copies were ordered to be subscribed for.

The Sub-Secretary presented on the part of Captain F. M. Crisp of Moulmein, a grass petticoat and scarf worn by the women of the better classes at Teresa, one of the Car Nicobar Islands.

Read a letter from the Count Ange de St. Prioux, proposing that the Society should contribute either by funds or by the purchase of copies of a work entitled, "Antiquités Mexicaines" to the expenses of a joint "Commission Scientifique Americaine" formed at Paris for the further exploration of American Antiquities.

It was resolved ; that the Society regret its inability to co-operate, but that it feels it to be its duty in the first place to lend all its assistance to the efforts which may be made to investigate the yet unexplored fields of purely Indian Antiquities.

The Secretary read extracts from a private letter to his address from Lieutenant Fletcher Hayes, 62nd N. I., dated from Kya Ghurra, N. W. of Shikarpore, in which that officer who had just returned with the troops from the campaign in the Murree and Bhogtee hills, mentions his having found the great utility of the “ admirable vocabulary ” of the Beloochee languages (by Major Leech), published in the Society’s Journal, (Vol. VII. p. 538) and offers additions to it both in words and in phrases : this the Society would most thankfully accept and give early publication to.

Read the following memorandum, accompanying one of the New Zealand Jade-stone idols presented to the Society by Captain Fox.

Memorandum.

This stone was sent from New Zealand by a Mr. Lucette to me,—The stone is of value,—and particularly so in China. The Idol is often passed as a heirloom from generation to generation, as the supposed certain means of preventing any casualty in a family when contagious diseases predominate.

W. Fox.

31st March, 1845.

Read the following letter from Colonel Ouseley :—

MY DEAR SIR,—I promised to send you a copy of the original Sketch I did, and forwarded June 13, 1834, to Lord William Bentinck, of the Nerbudda. I have added to this now sent the great coal field of Benar (and other coal) I discovered ; and hope you will complete the sketch you gave in No. 151. (No. 67, 2nd Series).

From the nature of the coal procured at Benar I am quite sure, that the Bombay and Calcutta railways should pass *there*. The best iron and the best coal in India are produced there. The line should run along the foot of the Hills, where the Nulas are small, not near the Nerbudda when the nullas become wide chasms, and ravines of such width and depth as would greatly add to the expense of the road.

J. H. OUSELEY.

Chota Nagpur, 29th April, 1845.

P. S. The whole of the remarks on the left and right banks of the Nerbudda noticed in the printed sketch are verbatim from my own map, and the divisions on both sides of Estates, &c. as you could see if you ask Major Wroughton, Deputy Surveyor General, to allow you to look at the original.

J. H. O.

The map sent by Colonel Ouseley extending from Jubbulpore to Hoshungabad, and that compiled by the order of the Government N. W. P. and reduced for the Journal, Vol. XIII., from Hoshungabad

to the sea, were both on the table. The Editors of the Journal were directed to give all due publicity to Colonel Ouseley's labours by an additional lithograph in the journal, including the coal site of Benar and railroad sketch as added by him.

Read the following letter from Captain Fox, giving an account of the loss of the collection made by him for the Museum :—

H. TORRENS, Esq. *Secretary, Asiatic Society.*

SIR,—In the month of January last year, Mr. Blyth of the Museum, put on board the vessel I commanded a box, together with a quantity of Arsenical Soap, and other articles for the cure of such of the desiderata at New Holland and New Guinea, I might be enabled to procure. The boy and I succeeded in obtaining at New South Wales a tolerably good and large variety of specimens, which were packed up, but getting wet I was compelled to order their being thrown away in consequence of the offensive effluvia they emitted. A Satin and Regent Bird I cured myself, and being badly done, I took less care of them; they were suspended in my cabin, and remained good, and I believe a hawk the boy kept with his clothes. I did not visit Maulmein, having resigned command of the vessel. Among other things I lost a beautiful Eagle-hawk, Black-swan and a Wallahby. I had fondly hoped to have been the first to have brought a large quantity of specimens from New Guinea for our Calcutta Museum; but that gratification I was compelled to forego in consequence of annoyance in Sydney. Subsequently I brought the boy with me in the "Minerva," by which vessel we returned passengers, and owing to the crowded state of so small a vessel, (146 tons with 100 souls on board) the Captain directed the large box to be put under the stern boat, and one Sunday morning we all saw the box for a few seconds astern, it having fallen overboard and sunk. The boy behaved very well and is an excellent lad, and no blame whatever can attach itself to him. I am very sorry for so great a loss; but I trust the explanation will meet your approbation.

Your most obedient Servant,

W. Fox.

Calcutta, 16th April, 1845.

The Secretary stated that he held in his hand two MSS. books, containing notes and sketches made in the Hills, which had been kindly forwarded for publication in the Journal by Captain Marshall, but that the Editors had thought with reference to the time elapsed since the notes were made, and their somewhat private and domestic character, that they were not exactly suitable for the pages of the Journal.

Memorandum.—These note books were subsequently withdrawn by Captain Marshall.

Read the following letter from the Local Committee of Education at Agra :—

To H. TORRENS, Esq. *Secretary, Asiatic Society, Calcutta.*

SIR,—The Local Committee of Education at Agra being engaged in the formation

of a Museum of Economic Geology, in connexion with the Agra College, direct me to address you on the subject, and to state that—

2. They doubt not but that they may rely on the sympathy of the Asiatic Society in favor of an undertaking which has for its ultimate aim the ascertainment and development of the mineral resources of this country, and primarily, of the North Western Provinces, as yet so imperfectly determined.

3. That should your Society be possessed of any disposable Geological Specimens of the economic kind, the Committee would feel greatly obliged by being favored with them.

4. As this work has been but just commenced, the Committee are at present unable to offer to your Society any thing in return; but they trust they may by and by be in a position to reciprocate the favor for which they now ask.

I have the honor to be, Sir, Your most obdt. Servant,

J. MIDDLETON,
Secretary.

Agra College, 1st May, 1845.

The Curator Museum Economic Geology stated that a few specimens would be available from that Department, and is preparing them for forwarding was accordingly sanctioned.

REPORT OF THE CURATOR GEOLOGICAL AND MINERALOGICAL DEPARTMENT AND
MUSEUM OF ECONOMIC GEOLOGY FOR THE MONTHS OF MARCH AND APRIL.
Geological and Mineralogical.

We have received from Government a report addressed by Captain Tremenhære B. E. of Maulmein to the Military Board, on the prices of tin ore, with specimens of tin ore from a new locality called Henzai to the north of Maulmein, and also of some supposed copper ores, or indications of copper, from the Maulmein hills in that vicinity, but on examination they prove to be only the well-known pavonine Antimonial coatings, as nothing but Antimony and Iron can be traced in them; though so much resembling copper as to be taken for it even by experienced persons.

This has been duly reported upon to Government, and Captain Tremenhære's attention directed to the scite of Batto Kayen Karian near Maulmein, from whence we have a true copper ore in the Museum; supposed to have been sent by Lieutenant Foley to Mr. James Prinsep.

Captain Phayre, Assistant Commissioner, Arracan has sent us from Sandoway a series of specimens carefully numbered and catalogued, with the following letter:—

“MY DEAR MR. PIDDINGTON,—You may remember you asked me to procure a series of the rocks occurring from the foot to the top of the *Aeng* pass. I have not been able to do this, but having gone in December to the top of the Yoma range of mountains, direct east of this town, I collected a complete series of the rocks and have now the pleasure to send them, together with a map, and a note on the route, &c.

I hope my remarks may be intelligible, though I have great doubts thereon, however, I have done my best to meet your wishes. I looked out particularly for the minerals you mentioned (and of which you sent a box of specimens, herewith returned with many thanks) but was not fortunate enough to meet with any. I could not delay at the spot, or I should have remained a day or two longer.

Sandoway, Feb. 25th, 1845.

A. P. PHAYRE.

P. S. In your letter dated the 4th August, 1844, you allude to a paper of *queries* regarding the volcanic islands on the coast ; this paper I never received, and I fear I shall scarcely be able to proceed to the islands this season ; but if you will kindly transmit the queries, they may induce me to go, and show me also what you require."

Captain J. Abbott, B. A. has obliged us with a paper on Kunkur, with specimens containing his views on its formation, which will doubtless be printed in the *Journal*, as offering, especially, views formed on the spot and in the alluvial soil : to which I refer more particularly, as Captain Newbold has lately favored us with his views principally from the Kunkur fields in the great trap formation of Central India.

Through Captain Baker, B. E. we have received a letter from Lieutenant Blagrave which should have accompanied his boxes of Scinde fossils and fish. It is as follows :—

To the Secretary to the Asiatic Society, Calcutta.

SIR,—I have the pleasure of sending you a few fossil shells and zoophytes found in the neighbourhood of Roree, Tatta, and Kurachee, also a few recent sea shells found in the tops of the sand hills in the vicinity of the Ullah Bund, and some fish from the Sindra lake. As I hear that the Society are publishing Sir A. Burnes' illustrations of the fishes of Scinde, some of these may be new, as I believe he got none of the fishes of the Sindra lake, and thought that none existed in it on account of the extreme saltness of its waters ; but when I visited it, in July last, the banks were strewn with fish and water insects evidently thrown upon the shore by some recent storm, along with several small dead birds and thousands of locusts, which had evidently perished in trying to cross the lake. There were several other kinds of fish both large and small, which I had not the means of carrying away with me ; many quite new, at least to me ; however, if I re-visit that neighbourhood, I will make a collection for the Society's Museum. I had intended sending a collection of recent shells from the beach at Clifton, (Kurachee) along with the fossil ones, for comparison, but I have had no time to make the selections or even to look over the fossils, among which there may be a lot of trash ; but should I be here another year, should the Society wish it, I will endeavour to make a good collection of both for them. I shall be employed in surveying the hills on the western boundary during the cold weather, and if I find anything worth sending will do so. Can you give me any hints for analyzing soils, as I think it would be to the advantage of Government were the different kinds of soils in Scinde known, and oblige,

Yours truly,

1st October, 1844, *Camp Kurachee.*

T. C. BLAGRAVE.

From Mr. Conductor Dawe we are apprised of the dispatch of five chests of fossils selected by him, under Captain Baker's directions, from the remains of the Dadoopoor Museum, which are on their way down to us.

We have to announce also two more papers of great importance from Capt. Newbold, being "Notes on the Geology of the Southern Mahratta Country," and "Geological Notes across the Peninsula," which will no doubt find an early place in our *Journal*.

MUSEUM ECONOMIC GEOLOGY.

We have received from Captain Sherwill a box of stones for trial as lithographic stones from the table-land of Rhotasghur, but I fear most of them will be found too siliceous or too thin. Many indeed are evidently defective, but some promise well, and I shall take steps to have them fairly tried.

Major Williams of Kyook Phyoo, who some time ago sent us a minute specimen of a stone called *Samy stone* in the West of India, as having been sold to his brother by a

Cavalry soldier, as highly valuable for the purpose of polishing the bits of bridles, (See Proceedings of January, 1845,) has now sent us a larger specimen, which proves it to be the common Agalmatolite only, and not as I had judged by the examination of the previous pepper-corn specimen, the fine variety called Pagodite. Major Williams says:—

MY DEAR SIR,—My brother has sent me a larger piece of the “Samy Stone,” and requests I would send it to you, and I shall feel extremely obliged if you could inform me where I can obtain a quantity of it. Dr. Rose has kindly consented to convey it to you. My brother mentions also his having sent your former letter to me on this subject to Mr. Murchison, the Geologist; the stone appears to be in request at home, more so perhaps than in India, where its use is not known apparently,

Kedgerie, 25th February, 1845.

D. WILLIAMS.

Whence I presume that it has been found, as I supposed, of use at home, or at least that, as I have remarked, it was thought well-worth attention when a quantity could be procured. I have written to Captain Onseley requesting him to send us a good cooley load of his Agalmatolite from Chota Nagpore, with which this is identical.

We have received from the Dundee Watt Institution, through Dr. Wise, a box of Mineralogical and Geological specimens, some of which are handsome and of interest, but many, indeed most of them are unfortunately without labels, which, for the Geological specimens particularly, is a very great drawback on their value.

Mr. W. St. Quintin, C. S. has referred to us from Darjeeling specimens of a quartz pebble and of fibrous hornblende rock, supposed to contain Gold, but the appearance is due merely to common pyrites. This might nevertheless be auriferous, but is in too small quantity to be detected in such very minute specimens; the rock might contain but one-tenth part of pyrites and the pyrites but one hundredth part of gold and yet be worth working on the large scale.

For all the above presentations and communications the best thanks of the Society were accorded.

Oriental Publications for Sale, at REDUCED prices, by the Asiatic Society.


WORKS.			Rs.	Former Price.
Mahábhárata, vol. 1st, pages 831, vol. 2d, pages 868, vol. 3d, pages 889, vol. 4th, pages 1007, royal 4to.	...	...	40	48
Large paper do. do.	...	...	50	61
Index to the 4 vols. of the Mahabharut complete.	...	...	6	0
Harriwansa, 563 pages, royal 4to.	...	...	5	6
Rája Taranginí, 440 pages, 4to.	...	...	5	20
Large paper, do. do.	...	...	8	12
Naishada, 917 pages, 8vo.	...	...	6	6
Sausruta, 1st vol. 378 pages, 2d vol. 562 pages, 8vo.	...	...	8	8
Fátawé A'lemgíri, 1st vol. 763 pages, 2d vol. 759 pages, 3d vol. 565 pages, 4th vol. 759 pages, 5th vol. 697 pages, 6th vol. 687 pages, royal 4to., per vol.	...	...	8	10
Ináya, 2d vol. 690 pages, 3rd vol. 682 pages, 4th vol. 937 pages, 4to.	...	...	8	10
Kházánat ul Ilm, 694 pages, 4to.	...	...	8	10
Jawáme ul Ilm ul Riázi, 168 pages, with 17 plates, 4to.	...	...	4	4
Anis ul Musharrahin, 541 pages, 4to.	...	...	5	5
Sharaya-ool-Islam, 631 pages, 4to.	...	...	8	15
Tibetan Grammar, 256 pages, 4to.	...	...	8	8
Tibetan Dictionary, 373 pages, 4to.	...	...	10	12
Asiatic Researches, per vol.	...	...	10	12
Burnouf Memoire sur deux inscriptions cunéiformes, 4to. 199 pp.	...	...	3	0
Burnouf Commentaire sur le Yacna, with notes &c. 2 parts, pp 945.	...	...	10	0

Rs. As.

Burnouf et Lassen, Essai sur le Palí, ou Langue Sacrée de la presqu'île au de lá du Gange. Paris, 1826, pages 222, 8vo.	...	...	3	0
Elémens de la Grammaire Japonaise, par M. M. Rodriguez et Remusat. Paris, 1825, pages 158, 8vo.	...	...	3	0
Ditto ditto Supplément. Paris, 1826, pages 31, 8vo.	...	...	...	...
Contes Arabes, traduits par J. J. Marcel. Paris, 1835, avec notes, vol. I. pages 484, vol. II. pages 496, vol. III. pages 508, 8vo.	...	...	3	0
Brosset, Elémens de la Langue Georgienne. Paris 1837, pages 122, 8vo.	...	...	5	0
Klaproth, Vocabulaire et Grammaire de la langue Georgienne. Paris, 1827, pages 232, 1st part, 8vo.	...	...	4	0
Cronique Georgienne, traduite par M. Brosset, Text and Translation. Paris, 1830, pages 370, 8vo.	...	...	3	0
Choix de Fables de Vartan, en Arménien et en Français. Paris, 1825, pages 96, 8vo.	...	...	1	8
Elegie sur La Prise D'Edesse, en Arménien. Paris 1828, pages 112, 8vo.	...	...	2	0
Chrestomathie Chinoise—Chinese Characters, 1833, pages 183, 4to.	...	...	5	0
Meng-Tseu, texte Chinoise, pages 161v, 8o.	...	...	3	0

Oriental Publications for Sale, at REDUCED prices, by the Asiatic Society—(Continued.)

	Rs.	As.
Meng-Tseu, traduction Latine, par S. Julien. Lutetiæ Parisiorum, 1824, pages 593, 8vo.	6 0
Lassen, Institutiones Linguæ Præcitiæ. Bonnæ ad Rhenum, 1837, pages 167, 8vo.	6 0
Lassen, Anthologia Sanscritica. Bonnæ, 1838, pages 371, 8vo.	4 0
Lassen, Gita Govinda, Sanscrit et Latine. Bonnæ ad Rhenum, 1836, pages 180, 4to.	2 8
Chezy, Yajnadattabada, ou La Mort D'yadjnadatta, Text, Analysis and Translation. Paris, 1826, pages 142, 4to.	3 8
Chezy, La reconnaissance de Sacountala, Text and Translation. Paris, 1830, pages 665, 4to.	10 0
Geographie D'Aboulféda, Texte Arabe. Paris, 1837-40, pages 586, 4to.	8 0
The Travels of Ibn Batuta, translated from the Arabic Manuscript, by S. Lea. London 1829, 143 pages, 4to.	6 0
The Travels of Macarius, translated by F. C. Belfour. London, 1829, pt. I. 114 pages, 4to.	4 0
Memoir of the Emperor Jehanguire, translated from the Persian Manuscript, by Major D. Price. London, 1829, 141 pages, 4to.	4 0
History of the Afgbans, translated from the Persian, by B. Dorn, part I. London, 1829, 184 pages, 4to.	5 0
Han-Koong-Tsew, or the Sorrows of Han, a Chinese Tragedy, translated by J. F. Davis. London, 1829, 28 pages, 4to.	1 8
Vocabulary of Scinde Language, by Capt. Eastwick.	1 0
Leech's Grammar and Vocabulary of the Baloochi and Punjabee Languages.	1 0
Points in the History of the Greek and Indo-Scythian Kings, &c. Translated from the German of Professor Lassen, by J. H. E. Roer, and Edited by H. Torrens, Esq.	5 0

 Separate articles of the Journal are also re-printed, and sold at proportionate rates.

FOR LIBRARY USE ONLY.

